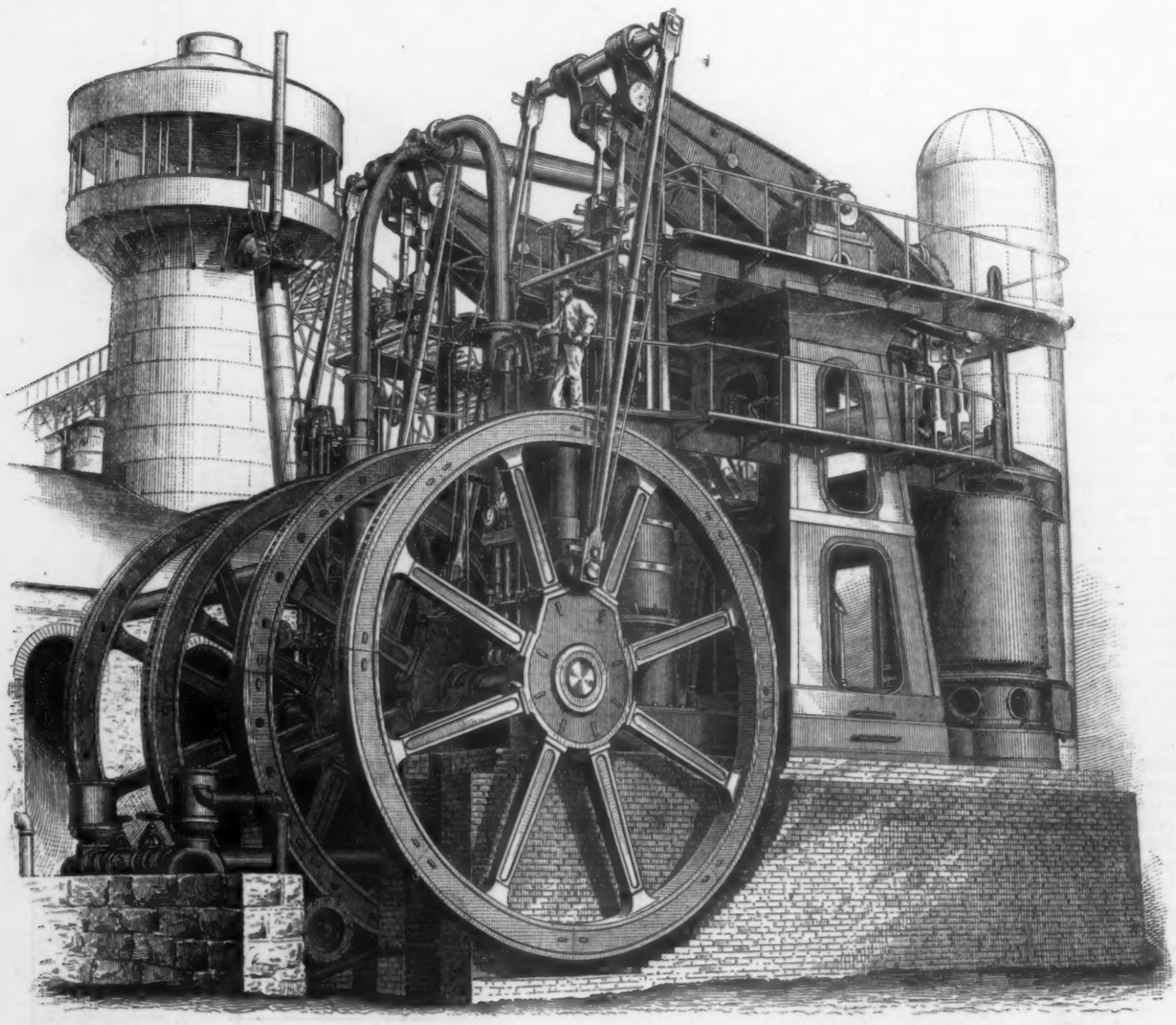
THE IRON AGE

THURSDAY, APRIL 5, 1888.

Blowing Engines for the Pioneer Mining and Mfg. Company.

Through the courtesy of the I. P. Morris Company (Port Richmond Iron Works), of Philadelphia, Pa., we are enabled to publish in this issue a general view and some details of a pair of blowing engines recently completed and erected by them for the Pioneer Mining and Mfg. Company, at Birmingham, Ala.



BLOWING ENGINES AT THE FURNACE OF THE PIONEER MINING AND MFG. COMPANY, BIRMINGHAM, ALA.

The engines are of the overhead type, with steam cylinders 60 inches in diameter, and blast cylinders 84 inches in diameter, both having a stroke of 7 feet. The box bed plates were made of sufficient length to receive the blast cylinders, beam columns, bases of steam cylinders and the main shaft pedestals, which are set beyond the steam cylinder bases and directly under the valve lifting rods. The beam columns are formed of truncated pyramids having flanges faced off and bolted through. The beams are double 5 feet deep at the middle, and 21 feet long between end pins, and are prolonged on the steam cylinder ends for the connecting-rod attachments. The blast cylinders are water-jacketed. The steam cylinders are fitted with Wanich's single beat balanced steam and water relief valves operated by Jones's Variable Cut-off Cams. Of both of these we give details on the succeeding pages. Some idea of the size of the engines may be obtained from the fact that the fly-wheels are 20 feet in diameter and weigh about 75,000 pounds. Recesses are cast in the rims, as shown, for the insertion of pry bars. The main shaft, beam centers, end pins, piston-rods, connecting-rods, crossheads and crank-pins are made of the best faggoted wrought iron. The condensing apparatus is of the usual air pump and jet condenser type, and arranged so as to be shut off, so that exhaust steam may be discharged into the atmosphere, if occasion requires, through a high pressure exhaust valve placed upon the upper steam-chest. Galleries and stairways to be provided, so arranged as to give convenient access to the cylinder heads, beam pin journals, guides and other elevated working parts requiring frequent attention. All the material and workmanship are of the bes t quality procurable. The Wanich valve, as shown in Fig. 1, consists of a disk with a cylindrical lip cast upon its circumference which is neatly bored on its inside surface. The lip has upon its lower edge the ordinary conical single face which is fitted to the seat on the steam-chest. Rising from the bottom of the steam chest is a circular plate whose exterior diameter is just enough less than the bore of the lip to permit free movement, and whose upper surface approaches closely to the under side of valve. Through the plate of the valve is a passageway having a conical seat closed by a small pilot valve, formed on the valve stem, which has a short lift limited by a guard. The parts are so proportioned that the area of passageway through the pilot valve is largely in excess of that between the edge of the circular plate and the inclosing lip on the main valve, so that when steam is admitted through the pilot valve it exerts pressure within the space inclosed by the under side of main valve, its lip and the top side of the circular plate; consequently, disregarding the annular surface of the main valve face, the pressure on the upper and lower surfaces of the main valve will approach equality relatively to the areas

of the passageways through the pilot valve and the fine annular space between the edge of the circular plate and the enveloping lip of the main valve. The circular plate is free to move upward whenever sudden extreme pressure results from the near approach of the steam piston to the cylinder heads. In such an event the plate rises from the excess of pressure upon its lower side and carries the valve with it, thus permitting the water to flow back into the steam-chest whence it is carried off by re-entering steam, and gradually passes out after a few strokes of the engine with the exhaust steam. This description will be more clearly understood by referring to the cut. Uniformly good results have been obtained from the use of Wanich's valves, not only upon blowing engines, but upon those of steamboats. It is also applicable to stop valves of large diameter under high pressures. The single seat can be relied upon for tightness, and in this plan the balancing feature makes its use possible for heavy pressures without the application of multiplying gear, thus securing a rapid closing.

The Jones variable cam consists of a plate secured to the engine shaft, or to a countershaft revolving simultaneously with the engine shaft, directly under its respective valve lifting-rod and having a swell upon its circumference with a rising incline which at the proper time comes in contact with the roller on the lower end of lifting-rod and moves it and its attached valve upward and admits steam to the cylinder. On the side of this plate is another arranged to revolve concentrically with it and also having a swell of the same hight with a falling incline, which, at a determined point of the piston stroke, revolves from under the lifting rod, permitting it to descend and close the valve and cut off the admission of steam. Fig. 2 clearly explains the construction. The cam is composed of the two plates A and B, the plate A being secured to the shaft G by a set-screw, *a*, passing through the hub of the plate, and the plate B being circumferentially adjustable on the shaft and maintained in contact with the plate A by a collar, *b*. The "swell" of the cam is partly on the plate A and partly on the plate B, and the circumferential extent of this swell may be increased or diminished by the adjustment of one of the plates so that the cam may have a longer or shorter dwell on the roller *p*, which is fitted to the valve-rod W. This is accomplished by having a portion of the plate A cut away, so as to leave two abrupt shoulders, *m n*, between which a toothed segment, concentric with the shaft, is formed on the plate. On the other plate, B, is a projection, *e*, in which are bearings for a small spindle carrying a worm, which gears into the teeth of the segment *d* of the plate A. When the worm is turned in one direction, the swell of the cam will be diminished circumferentially in extent, and it will be increased in extent when the worm is turned in a contrary direction. The worm spindle also carries a worm-wheel, *g*, into which gears a worm, *h*, on a spindle, having its bearing in the plate B, the outer end of this spindle being furnished with a star-wheel, *j*, the turning of which will necessarily result either in the circumferential contraction or extension of the swell of the cam, according to the direction in which the star-wheel is turned. The plate A is recessed at the back for receiving a portion of the plate B. The edge of the swell cannot of course be of uniform width, for it is composed partly of a projecting portion of the plate A, the thickness of which is shown in the end view in Fig. 2, partly of that portion of the plate B where the projection *e* occurs, and the thickness of which (also shown in the end view) is the same as that of the last-named portion, and partly of the thin portion of the plate B, which always forms a bridge between the thick portion of the swell on the plate A, and the thick portion of the swell on the plate B. In other words, the swell of the cam has the same continuity as a solid cam of uniform thickness. It will be understood, however, that to insure a proper continuity the roller *p* must be as wide as the thickest part of the swell of the cam.

Mr. Wm. P. Thomas, of the I. P. Morris Company, writes us that while the engines are completed they have not yet been put in operation, owing to the fact that the other part of the plant is not yet finished.

It is now thoroughly understood that in the prevention of condensation in the cylinders of a steam engine lies almost the only hope of further augmenting economy. Not only is this true, but it is also certain that by preventing internal condensation not a little, but a considerable loss would be avoided. The mode of action of steam in, say, a triple-expansion engine is very curious. It is entirely different from that of any other working fluid, such as gas or air, and it has little or nothing in common with the theoretical action of the ideal fluid as elaborated by the mathematician and the physicist.

American Foundry Iron.

The following notes were suggested by the collection of a set of specimens, prepared by Mr. W. J. Keep, for the metal-

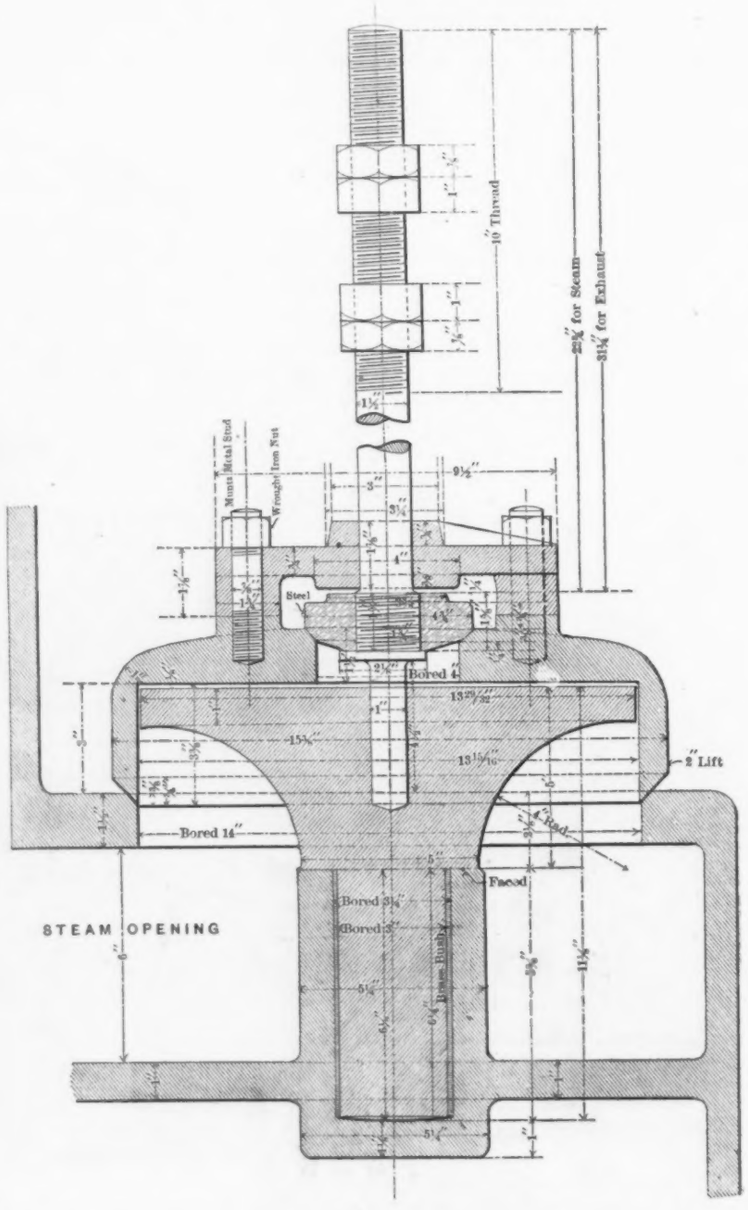


Fig. 1.—Section of Wanich Valve on Steam Cylinders.

DETAILS OF BLOWING ENGINES AT BIRMINGHAM, ALA.

lurgical department of the Mason College, Birmingham, England, and intended to be used for teaching purposes. The memoranda accompanying them were not originally intended for publication, or possibly irons might have been selected which would have shown American production in a somewhat more favorable light. The paper was read before the South Staffordshire Institute of Iron and Steel Works Managers. The irons shown were selected from the collection in the physical laboratory of the Michigan Stove Company, Detroit, of which company Mr. Keep is superintendent. The collection is not intended to show the irons actually used by the Michigan Stove Com-

pany, but to illustrate average American foundry iron; these specimens are especially valuable from the fact that in most cases they are samples of the identical irons of which a most complete series of physical tests has been performed and of which the chemical analysis is known. Ores of good quality occur throughout extensive districts in the United States. The specimens now shown are intended to illustrate only the irons produced at some of the most important points, and from the principal ore formations. These ore deposits are:

1. The great deposit of magnetic ore beginning on Lake Champlain, in Northern New York, and running southward through that State into New Jersey and still southward into North Carolina. Also the brown hematites which accompany this deposit.

2. The great deposit of red fossil ore, running about 100 miles west of the previous deposit, beginning in Central New York, running through Pennsylvania and southward to the immense beds of Alabama. This deposit also has continguous brown ores.

3. The carbonaceous ores of Kentucky and Ohio.

4. The unlimited ore deposits of Lake Superior.

In this brief survey we cannot even speak of numerous other very important deposits, such as those of Missouri, where Pilot Knob and Iron Mountain are of solid ore, or the brown hematites of Tennessee, or the deposits of Wisconsin and other districts. In these instances the ores are chiefly smelted with charcoal.

In the case of the Great Southern Ore deposit, the ore and coal lie in the same hills, and hence need no transportion; but very frequently in the United States fuel is transported to considerable distances; in other cases ore is carried, while sometimes ore and fuel are both transported to some intermediate locality. In Eastern Pennsylvania are the great anthracite coal fields, which are reached by a complete system of canals and railways from the Hudson River. In Western Pennsylvania are immense bituminous coal formations, from which excellent coal is made. In Ohio is found block coal, which can be used raw in the blast furnace. In Alabama, the best of coking coal occurs with the ore. The chain of great lakes, the St. Lawrence River, Lake Champlain, and the Hudson River, with canals and railways, give facilities for cheap transportation of Lake Superior or Lake Champlain ores to the coke of Western Pennsylvania, to the anthracite of the eastern portion of the same State, or to the coals of Ohio. On the other hand, when necessary, the fuel may be cheaply conveyed to meet the ore.

Poughkeepsie Irons.—This may be taken to illustrate the irons made from the magnetites of Northern and Southern New York, and the brown hematites on the east side of the Hudson; the fuel used is anthracite coal. Poughkeepsie is on the Hudson River; the furnaces are of the older type, 60 feet high with 16 feet boshes; temperature of blast about 1100° F., pressure 8 pounds per square inch. The ores employed are used in equal proportions, thus: One-third magnetic ore from Mineville, Essex County, N. Y. (Lake Champlain ore.)

One-third magnetic ore from Fort Montgomery, Orange County, Southern New York.

One-third brown hematite ores from Sylvan Lake, Buckman, and Clove Valley, Duchess County, N. Y.

These ores have approximately the following composition:

	Metallic iron.	Silica.	Phosphorus.	Oxide of manganese.
Lake Champlain.....	67.19	1.14	0.84	. ..
Fort Montgomery ...	61.95	7.20	0.24	....
Sylvan Lake.	51.02	8.51	0.06	trace
Clove Valley.	49 04	11.95	....	2.71

Buckman resembles Clove, but contains less manganese. The limestone used is taken from the bank of the Hudson River, and the furnace charge yields about 55 per cent. of metallic iron. As illustrating the regular working of this furnace, we may mention that in 1870 Mr. Keep made a memorandum of what he saw charged while spending a day at the works, and this exactly corresponds with the above record of what is used at present. The iron is graded as No. 1 and No. 2 Foundry, No. 3 Gray Forge and No. 4 Mottled. They endeavor to make entirely No. 1 Foundry, and other grades come from various changes in furnace working; mottled is seldom made. Analyses of the iron are as follows:

	Carbon.			
	Total.	Graphitic.	Combined.	Si.
No 1 Foundry.....	4.24	... .	.....	3.01
No. 3 Gray Forge...		.....	.....	1.17
No. 1 Foundry... ...3.266		3.166	0.100	2.948
No. 2 Foundry. 3.572		3.457	0.115	1.642
	P.	S.	Mn.	Iron.
No. 1 Foundry.....	0.15	0.05	1.46	90 64
No. 3 Gray Forge...1.63		0.15	1.08	91.96
No. 1 Foundry.....1.242		trace	0 189	.....
No. 2 Foundry.... . 1.224		0.035	0.241	....

The first two of these analyses were supplied by the furnace company. The two last analyses are of pigs from the same stock pile as that from which the pig was taken for physical tests, to be described in our next paper.

Bushong Iron.—This sample illustrates the production of the Keystone Furnace Company, of Reading, Pa., situated in the heart of the anthracite coal region. The ore mixture consists of one-third brown hematites, obtained near the furnace with two-thirds of magnetite, principally from New Jersey and Lake Champlain. The iron is graded A1, B1, No. 2 plain, and gray forge. They run on A1, but sometimes get off on lower grades. A pig from the same pile as the pig used for physical tests had the following composition:

	No. 1 Bushong.
Carbon { Total	3.343
Carbon { Graphite	2.879
Carbon { Combined	0.464
Silicon	1.932
Phosphorus	1.089
Sulphur	0.013
Manganese	0.136

Red Fossil Hematite Irons.—The collection includes two samples intended to illustrate the great red fossil hematite formation—one from the Franklin furnaces, of Clinton, Oneida County, N. Y., situated at the extreme northern end of the formation; the other, from the Alice furnaces, of Birmingham, Ala., at the extreme southern limit of this ore deposit. The Franklin furnaces use anthracite coal from Pennsylvania. The Alice furnaces are fitted with modern Whitwell stoves, and doubtless work hotter and more rapidly. At both localities two veins of ore occur, one hard and the other soft. At Clinton the soft ore is 1 foot thick and has been abandoned; the hard ore now used is 2 feet thick. In Alabama both hard and soft ore are used, and occur in beds from 20 to 30 feet thick. In most cases the ores are self-fluxing. The following are examples of analyses:

	Clinton soft (abandoned)	Clinton hard (used).	Alabama hard.	Alabama soft.
Metallic iron.	30.08	47.56	36 00	50.00
Silica.....	29.72	11.30	8.00	16.00
Alumina.....	4.13	4 85	... .	.....
Lime...	8.57	5.52	38.00	.....
Manganese.....	0.31	0.1?	race	trace
Phosphorus.....	0.67	0.5?	0.42	0.70
Sulphur	8 ?? ?	0 1?	....	.....

The analyses of the irons were as follows:

	No. 2. Franklin.	No. 2. Alice.	No. 1. Rising Fawn.
Carbon { Total	3.179	2.963	4.233
Carbon { Graphite	3.064	2.742	3 981
Carbon { Combined	0.115	0.2.1	0.252
Silicon.....	3.014	4.853	1.736
Phosphorus.....	1.433	0.597	0.828
Sulphur..... .	0.07?	0.010?	0.018?
Manganese..	0.168	0.199	0.012

The physical tests of Franklin and Alice iron, to be referred to in a subsequent paper, were made from the same stock pile as the above. This specimen of No. 2 Alice is not a fair sample of the iron usually made. It was sold for, and appeared like, a close No. 2, but both physical and chemical tests show it to be a silvery iron. High temperature, with rapid running, has given high silicon and low carbon, while pure ores have produced a low phosphorus. An analysis is also given

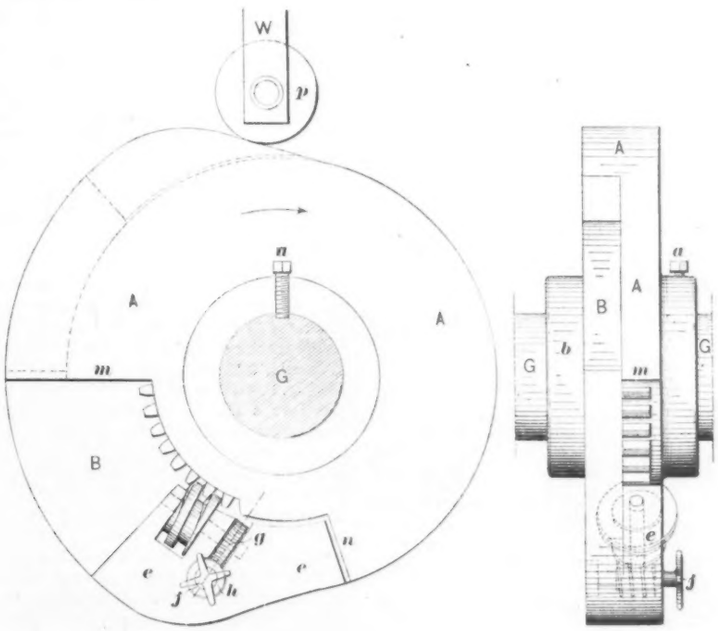


Fig. 2.—The Jones Variable Cam.

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of iron from the Rising Fawn furnaces in the northwest corner of Georgia, said to be from a No. 1 pig. This shows more time given for carburization, hence the production of an open grain. In this case also the silicon is rather low; we should say that the silicon in Southern irons would usually run between the extremes above given, generally being nearer the lower than the higher value. The manganese in Southern irons is very low, and they show but slight tendency to chill.

Dayton Iron.—The collection of specimens illustrating the production of the Dayton Coal and Iron Company, of Dayton, Tenn., are of special interest, not merely on account of the completeness of the series exhibited, but also because a complete series of physical and chemical tests are at present being conducted on these irons by Mr. Keep and Mr. H. S. Fleming, and of these tests we hope at a future time to give some account. The samples were selected with special care by Mr. Fleming (who is now superintendent of Mayville furnaces, Wisconsin), while he was chemist to the Dayton Company. The ore mixture remained the same while the samples were being taken, and was much the same as that of the other Southern furnace previously mentioned, except that a little brown ore is used. Owing to the needs of their trade at Dayton, they make an iron which is slightly higher in phosphorus than most other Southern furnaces. The grading is strictly in accordance with the practice of Southern furnaces. It will be noticed that the highest grade is No. 2 foundry. This is a peculiarity of Southern grading, though a Southern No. 2 compares favorably with a No. 1 from many Northern furnaces. In the South the furnaces are generally of the modern type, with Whitwell stoves, and run so hot and so rapidly that the grain is a trifle close and the color light when compared with the No. 1 from the older furnaces. An old furnace at Birmingham, Ala., running more slowly, but using the same ores, makes as dark and open a No. 1 pig as any of the Northern iron, and shows a high percentage of carbon. This illustrates the difference caused by various methods of furnace working.

In the South there are large beds of red ore now opened, and which will shortly have railway facilities; they yield 59 to 62 per cent. of iron, 6 to 8 per cent. of silica, and 0.25 per cent. of phosphorus, with practically no manganese. It will be seen that this is nearly a Bessemer ore. The Southern brown ore contains about 0.68 per cent. of manganese, with 0.27 per cent. of phosphorus. On account of this composition, brown ore is used alone in Southern charcoal furnaces to produce a chilling, car-wheel iron. Southern irons are produced cheaply, and on account of their low price have a considerable influence on the iron market of the United States; hence we have given a somewhat lengthy account of them.

Irons from the Carbonaceous Ores of Ohio.—These ores occur in N. E. Kentucky and S. E. Ohio, and from a village in the center of this region, where the ores were first used, they obtain the name of "Hanging Rock ores." They are also called limestone ores, not because they contain limestone, but because they are found on a limestone bed rock. These ores produce an iron high in silicon, sometimes as high as 6 per cent., and in the market such irons take the name of "softeners." We have selected two samples of such irons, "Wellston" and "Globe." The samples of Wellston irons are specially interesting. Specimens might have been forwarded of iron from other furnaces which would have been at least as representative of the district as Wellston irons. But this collection is pretty complete, and was selected by the superintendent of the furnaces, while the ore mixture remained the same. The specimens illustrate the grading and character of these pigs, and physical tests have been performed on these irons, which will be recorded in our next paper.

Special interest is attached to Ohio silicious irons, because for the last 25 or 30 years this class of iron has, to a limited extent, served the purposes for which silicon pig is now used in England. Now that the reason for such practice is better understood, the use of silicious iron is spreading in America, and as Ohio softeners are generally low in other impurities, the silicon is thus obtained in such a form that it acts beneficially on the other irons in the foundry mixtures. Silicious irons are not used in all parts of the United States, as Eastern irons have generally enough silicon in them already. But in those localities where silicious pigs can be easily obtained, irons can also be easily and cheaply procured, either from the rich Lake Superior ores or from the South, which have hitherto been rather too low in silicon for foundry purposes. With the newer furnaces we may expect the Southern irons to be more silicious.

The fuel used for the production of much of this high silicon iron of Ohio and Kentucky is a mixture of two-thirds of raw and one-third coke. An analysis of the coal used at the Wellston furnace is as follows: Water, 11.26 per cent.; volatile matter, 28.96; fixed carbon, 55.59; phosphorus, 0.71; ash, 3.46. The limestone used at the same furnace contained: Carbonate of lime, 93.03 per cent.; silica, 1.51; sulphur, 0.02. The limestone ores, which are of the "Hanging Rock" class, are used roasted; partial analyses of samples are as follows:

	I.	II.	III.	IV.	V	VI.
Silica	13.61	15.40	26.22	17.90	25.39	25.89
Alumina	3.00	....	0.68	. .	....	5.16
Lime	2.90	....	5.24	...	1.25	....
Sulphur	0.34	....	0.11	..	0.73	0.082
Phosphorus	....	0.36	0.18	0.29	0.17	0.488
Metallic Iron	39.02	27.00	42.93	49.76	....	41.62

Some old analyses, from another furnace using a mixture of the identical ores mentioned above, may serve to illustrate the grading and characters of these irons:

	A 1 Gray Foundry	Strong. mill.
Graphitic carbon	2.576	.
Combined carbon	....	....
Silicon	6 671	2.589
Sulphur	trace	0 091
Phosphorus	0.503	0,798

	Weak. mill.	Hard silvery.	No. 4 white.
Graphitic carbon	2.59	....	....
Combined carbon	0.16	....	1.822
Silicon	3 924	5.063	6.655
Sulphur	0.083	0.048	0.093
Phosphorus	0 547	0.755	0.643

Manganese not estimated, but probably under 0 5 per cent.

The physical tests of Wellston irons are very interesting, and it is intended to perform analyses of these samples when opportunity offers. The grade of these silicious irons can of course be varied at will by alterations in the quantity of limestone, and of the heat of the furnace. Globe iron is from the same district. The sample exhibited is a No. 1 pig, and has the following composition:

Carbon	Total	3.154
	Graphite	2 852
	Combined	0.302
Silicon		5.899
Phosphorus		1.100
Sulphur		0.02
Manganese		1.00

A pig from the same stock pile was also tested physically, and the results will be given in the second part of this paper.

Irons made from the Ores of Lake Superior.—In concluding this very incomplete account of the foundry irons of the United States, we take samples made from the great ore deposits of Lake Superior. Among the specimens exhibited is a collection of the grades of iron made at the Spearman furnace, situated in Western Pennsylvania, near to the well-known Connellsville coke district. The ore used is purchased, and is not confined to a definite mixture, but consists chiefly of hard and soft Lake Superior ore. Many furnaces in this district use some 25 per cent. of Lake Champlain ore to give a more neutral mixture. The specimens shown may be considered to fairly represent the product from the large number of furnaces which are situated near the coke, and which purchase their ore; this is obtained either wholly or in large proportion, as the case may be, from the deposits of Lake Superior.

There is also a very interesting collection of examples of iron made from Lake Superior ores, and smelted with charcoal, at the Gaylord furnace, Detroit, Mich. Several of these specimens have been analyzed by Mr. Fleming, and his results are as follows:

	Silicon.	Phosphorus.
Gaylord No. 2 Foundry	1.570	0.240
Gaylord No. 3 Foundry	0.800	0.144
Gaylord white	0.186	0.263

	Sulphur.	Manganese.	Iron.
Gaylord No. 2 Foundry	0.041	....	94.288
Gaylord No. 3 Foundry	0.056	....	94.688
Gaylord white		0.092	....

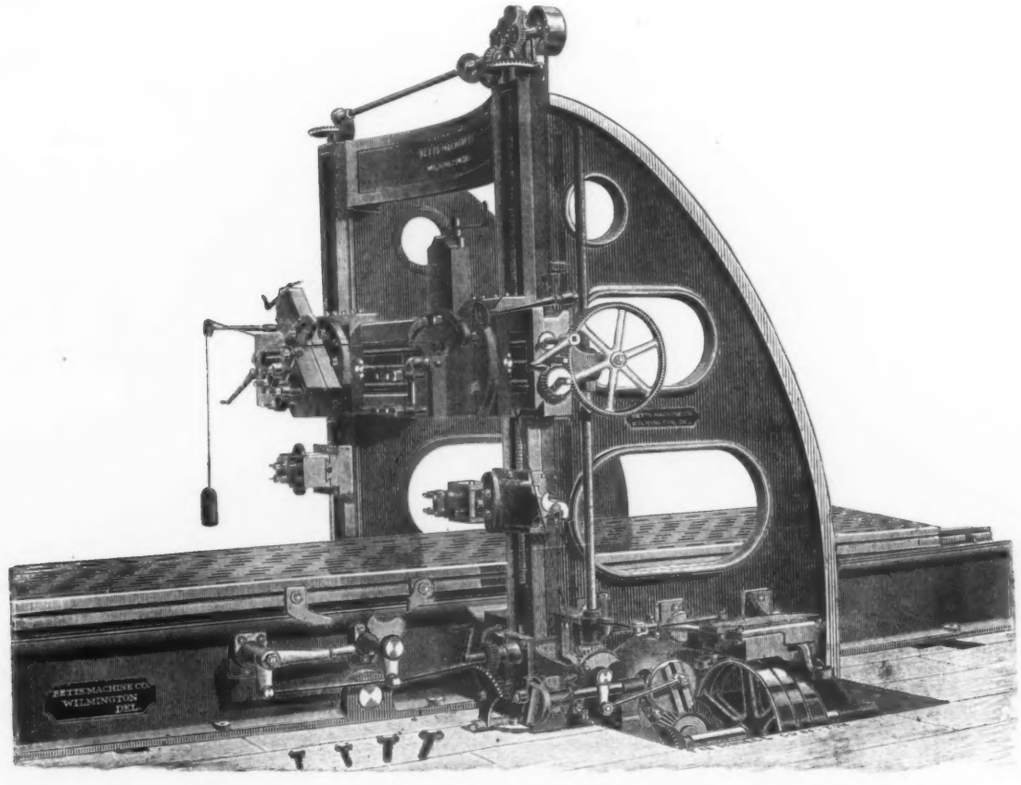
It will be seen that these irons are of exceptional purity, and may be considered above the average for foundry purposes. They are chiefly used for special purposes, such as the manufacture of car wheels. At a future time we may be able to publish details of physical tests of these specimens.

The coke market has gone to pieces, and last week witnessed a further decline in prices of fully thirty-five cents per ton, or below the dollar line. On Tuesday, the 27th ult., a meeting of the operators was held in the office of the old syndicate in the Lewis Block, Pittsburgh, which was largely attended, all the operators in the region being present with the exception of H. C. Frick, the president of the H. C. Frick Coke Company, and two or three of the smaller operators. During the early part of the meeting several plans for the restriction of production and the advancing of prices to $1.50 per ton were discussed at length, but without any action being taken. The members of the Producers' Association were also out in force, and as soon as possible they presented a claim to the members of the old syndicate for $25,000 for damages in discrimination in car supply, and also stated that unless the claim was paid that they would withdraw from the meeting and would not be bound by any action that might be taken. This claim was discussed at length, with the result that its payment was refused and the meeting at once adjourned, and from present indications it will be some time before the operators come together again. All hopes of forming a syndicate have been abandoned and a most bitter warfare has been commenced which may prove disastrous to many engaged in it. It is a well-known fact that coke cannot be produced and sold at a profit of $1 per ton, and unless some plan is adopted at an early day to better the situation the smaller operators will be compelled to retire from the market and close down their ovens, while the larger operators, one or two of whom have contracts on hand for $1.35 coke, will continue to run in order to fill their contracts, and also to hold their trade, even should they be compelled to sell their product at cost or even less. A reduction of wages will also be demanded at once, as the present rates of wages are based on $1.50 coke, and of course will not be paid when the price is fully 50 cents per ton under this figure. The situation is indeed a gloomy one, and from present appearances an improvement cannot be looked for, while every indication points to a worse state of affairs than exists at present.

Six-foot Planing Machine.

The Betts Machine Company, of Wilmington, Del., is building an improved form of 6-foot planer, shown on this page. The machine was designed for strength and rigidity, convenience and rapidity in manipulation, and accuracy in the work performed. It is powerfully geared, having a belt speed of 124 feet to 1 foot of table. The driving shafts are of unusual strength, the gearing is all cut and the pinions are of wrought iron. To prevent the wear and tear on belts, and to do away with the usual squeaking noise, the shifters are made to throw one belt ahead of the other. The arrangement of shifter leavers is such that the workman has complete control of the machine from either side. There are feed motions on both sides of the machine, giving independent feeds to the saddles and side heads. The cross-rail is designed for the heaviest class of work, and can be raised and lowered by power. By a device for disengaging the up and down slides in the saddle, either or both of the slides can be used at pleasure.

The machine has four tools, two on the cross-rail and one on each upright. It can be arranged with one or more tools, depending on the class of work for which it is intended.



SIX-FOOT PLANER, BUILT BY THE BETTS MACHINE COMPANY, WILMINGTON DEL.

It is thought that Wall street affords an excellent field for the employment of pneumatic tubes by which the conveyance of messages and securities could be conducted more rapidly and satisfactorily, and it is stated that a number of gentlemen connected with the New York Stock Exchange have formed an organization for the purpose. The system under which it is proposed to work is known as the Clay Electric Pneumatic Tube, the principal feature of which it is claimed is the ability to send carriers through the tube to different destinations (which will be the offices connected with it) by means of electric switches which throw the carrier off the main line and automatically closes the switch. It is also stated that a complete working plant is now being erected in Wall street in order to exhibit the practicability and usefulness of the project.

Photography and Forgeries.

Dr. Jeserich, of Berlin, has enlisted the services of photography in an important field. He employs it in the discovery of forgeries in documents. Recently he photographed an entry in a ledger handed to him by the public prosecutor as suspicious. As the event proved, the forgeries had been made with a bluish ink, which appeared very indistinct in the photograph taken, while the original entries, which had been written with a black ink, came out sharply defined. Subsequent chemical examination of the portions of the writing which the preliminary photographic test had disclosed to have been forged fully confirmed the discovery made. In a second case, it was necessary to establish certain forgeries in a check. Photographic aid disclosed the fact that the month of *Mai* (German for May) had been changed to "April" by converting the second down stroke of the capital letter *M* into a *p*, transforming the letter *a* into an *r*, and adding an *l*. The great value of these photographic determinations consists in enabling the expert to supply direct proof in support of his opinion by submitting accurate reproductions, while chemical examination furnishes merely more or less circumstantial evidence. Moreover, in employing photography the exact picture of the document forged is preserved, while by chemical examination the object is sometimes completely destroyed.

Mr. James Henderson reports that he has found, in his experiments at Birmingham, Ala., in making steel on a fluorspar-dolomite basic bottom, that phosphorus is largely volatilized. In making about one ton of mild steel from two-thirds pig and one-third scrap, carrying from 0.60 to 0.64 of phosphorus, he added 250 pounds of ore containing 45 per cent. of iron and 0.7 of phosphoric acid. The slag produced—about 200 pounds—carried 8 per cent. of iron as peroxide, 29 per cent. of silica, 0.9 per cent. of sulphur, and 1 per cent. of phosphorus. The steel had only 0.075 of phosphorus. Thus, roughly, nearly 90 per cent. of phosphorus remains unaccounted for, which, Mr. Henderson holds, must have been volatilized.

A correspondent of *The English Mechanic* gives the following recipe for a curious alloy: Put into a clean crucible an ounce of copper and an ounce of antimony; fuse them by a strong heat, and pour the alloy into a mold. The compound will be very hard and of a beautiful violet hue. This alloy has not yet been applied to any useful purposes; but its excellent qualities, independent of its color, entitle it to consideration.

The prevalent idea that wheat growing has ceased to be profitable in California is combatted by the San Francisco *Journal of Commerce*, which says that, "with proper care, the soil of California can be made to produce as largely as that of Great Britain. The usual average of California, taking good and bad years, is perhaps 16 bushels to the acre. Great Britain produces almost double. Let California, with care, produce like Great Britain, and on her 25,000,000 acres of wheat lands she can have 400,000,000 bushels over and above her present acreage. At 80 cents a bushel this would amount to $320,000,000—three hundred and twenty million dollars of profit over and above what could under the present system of cultivation be had. It is evident that wheat growing is to be a great feature in California agriculture in the future as well as in the past."

Unrestricted Reciprocity and Commercial Union.

The Dominion is just now deeply agitated on the subject of commercial union with the United States. The question has become conspicuous as an outgrowth of the fisheries discussion and difficulties encountered by the great grain-growing province of Manitoba in seeking a market for her cereal products. So familiar have these topics become through protracted discussion that the most ordinary mind in the Dominion rises to at least a partial comprehension of the issues involved, as affecting various material interests, such as manufactures, lumber, agricultural products, &c. Most potent of all influences in bringing trade relations with the Union into prominence is the position taken by Sir Richard Cartwright, the liberal leader, who lately for several consecutive days has had the exclusive attention of the Parliament at Ottawa, and whose voluminous exposition of the state of Canadian trade and commerce has occupied columns of the newspaper press. After endeavoring to show by an array of statistics that the Dominion fails to retain more than a small proportion of the immigrants who are assisted from Europe for colonization purposes—that, indeed, 900,000 of the native population are to-day inhabitants of the United States, exclusive of immigrants, and that there has been a large reduction in the price of the land as well as its products, also in the volume of trade—Sir Richard Cartwright sees no other remedy than unrestricted trade. He points to "the great and growing character of the American market, and the plain and obvious fact that we in Canada, from our geographical position, are to a very great extent shut in practically to two markets only, the markets of England and her colonies and the markets of the United States." He believed that "all manufacturers who deserve to flourish in Canada on account of pluck, and capital, and energy, will prosper likewise enormously if that great market be opened to them." Against all such views the so-called Tory party now in power are fiercely opposed, and the explanation is found, if we may believe such organs as the Montreal *Herald*, in the desire to realize the "fad of Imperial Federation." Those who cry loudest for federation, we are assured, are identical with those who declaim against unrestricted reciprocity.

Among the most enthusiastic advocates of "continental free trade" is Goldwin Smith, president of the Commercial Union Club, of Toronto, who, in a recent communication, frankly avows his belief "that the day will come when the English-speaking race upon this continent will be one people, when the great Anglo-Saxon heritage will be amicably divided between the European and American branches of the race, and England, as the parent of all, will rejoice in the reunion." He contends that "the party in power at Ottawa is losing all the Provincial Legislatures and Governments, which will soon be arrayed in solid phalanx against it," but in a more recent interview Mr. Smith was constrained to admit that the Tory Government of Canada is so strongly entrenched that the movement in favor of extended trade relations is sure to be defeated. In any event, this movement in its origin is "popular and spontaneous" and constitutes "a great and memorable step" toward the end in view, especially while its advocates assume with confidence more will be heard when the issue is submitted to the people in a general election.

As "reciprocity" necessarily implies the existence of two parties in order to

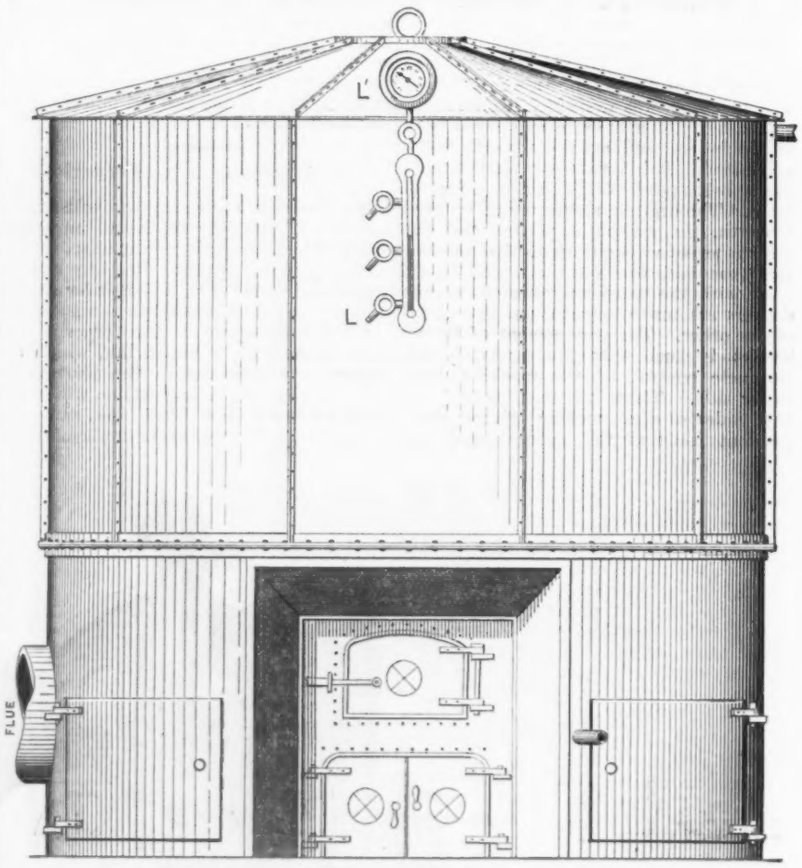


Fig. 1.—Elevation.

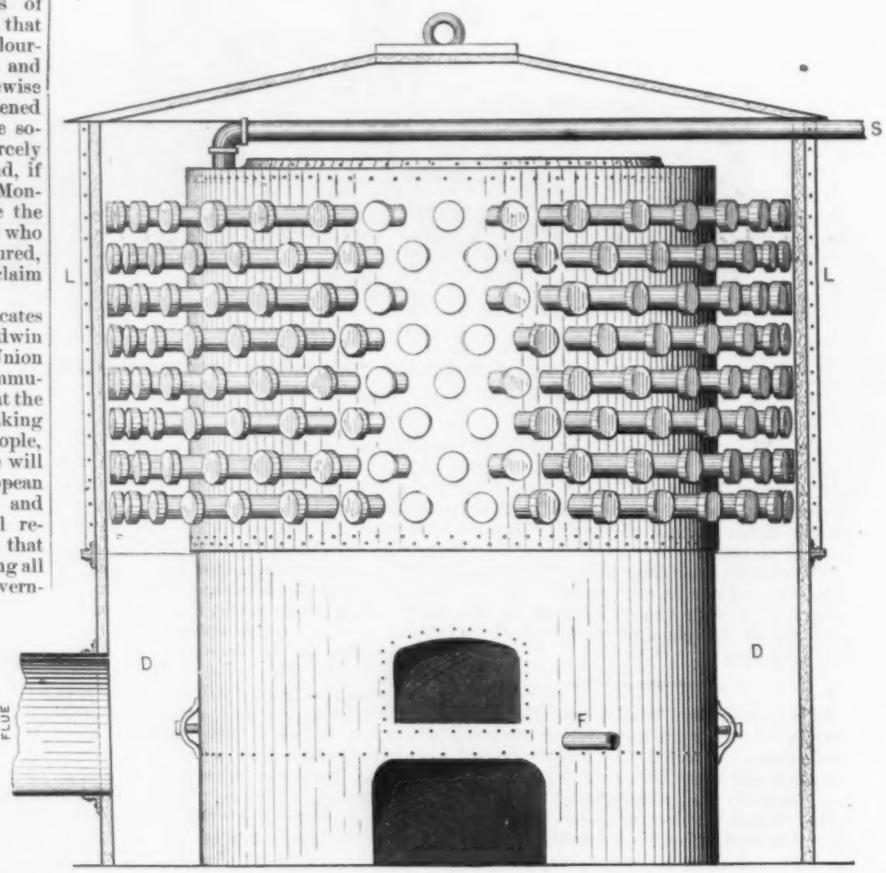


Fig. 2.—Elevation with Mantle Partly Removed.

VERTICAL TUBE BOILER, BUILT BY THE VERTICAL TUBE BOILER COMPANY NEW YORK.

secure mutuality, it becomes interesting to anticipate the manner in which overtures from the Dominion may eventually be received in the United States. A few days ago the House Committee on Foreign Relations unanimously voted to report favorably the Hitt resolution "to promote commercial union with Canada," but Congress thus far does not betray an earnest purpose in support of the measure, and in the present temper of that body it would be rash to predict a result different from that which befell the reciprocal treaty with Mexico.

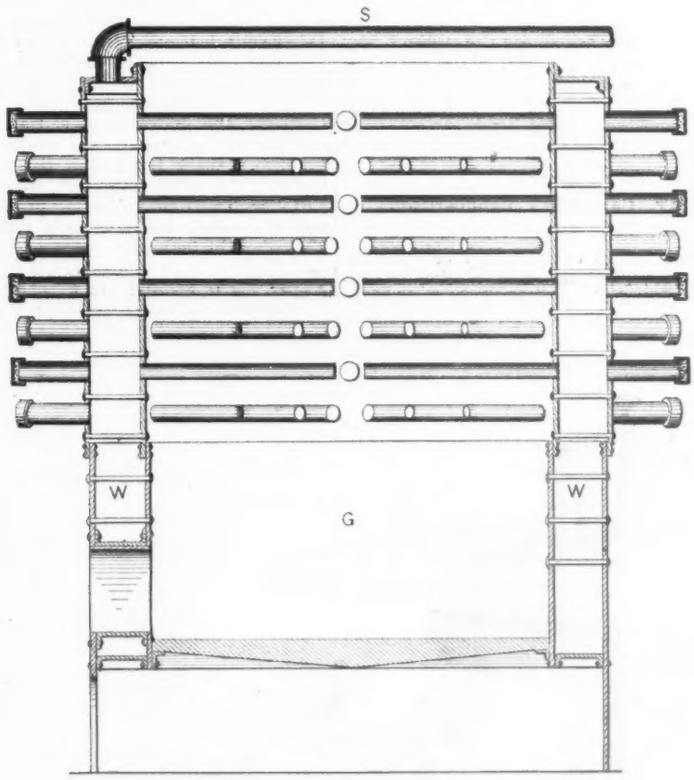


Fig. 3—Vertical Section.

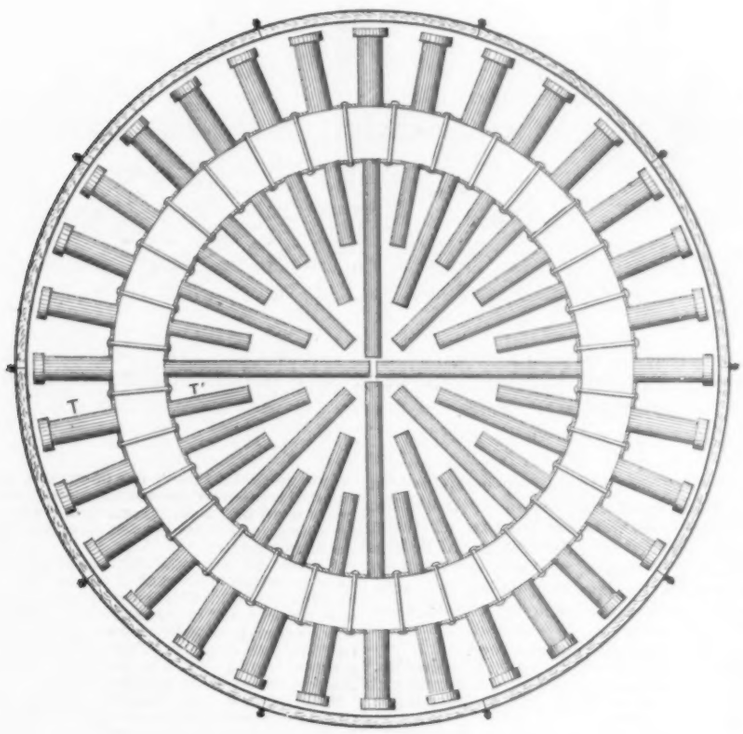


Fig. 4.—Plan and Section.

VERTICAL TUBE BOILER, BUILT BY THE VERTICAL TUBE BOILER COMPANY, NEW YORK.

A powerful ice-breaker, called the St. Ignace, has just been finished at Detroit for use in the Straits of Mackinac. She is 235 feet long, 52 feet beam, 25 feet molded depth and has two wheels, the forward one weighing 17 tons and the one aft 6 tons, so she can go backward or forward. It is expected she will steam 15 miles per hour and draw 7 feet of water with ten loaded cars aboard. Her builders claim she can break through 4 feet of ice. There are 18 engines aboard, one for almost everything, and six engineers are numbered among the crew. She is owned by the Michigan Central, the Grand Rapids and Indiana, and the Marquette railroads, and cost $290,000.

Vertical Tube Boiler.

As an example of recent development in tubular steam boiler construction, we take pleasure in submitting in this issue engravings of a vertical boiler built by the Vertical Tube Boiler Company, 2197 Third avenue, New York. The boiler is of the tubular class, and resembles in its general characteristics the so-called "porcupine" boilers which were first given prominence a few years ago, and for which important advantages were claimed in point of evaporative powers and the utilization of waste heat.

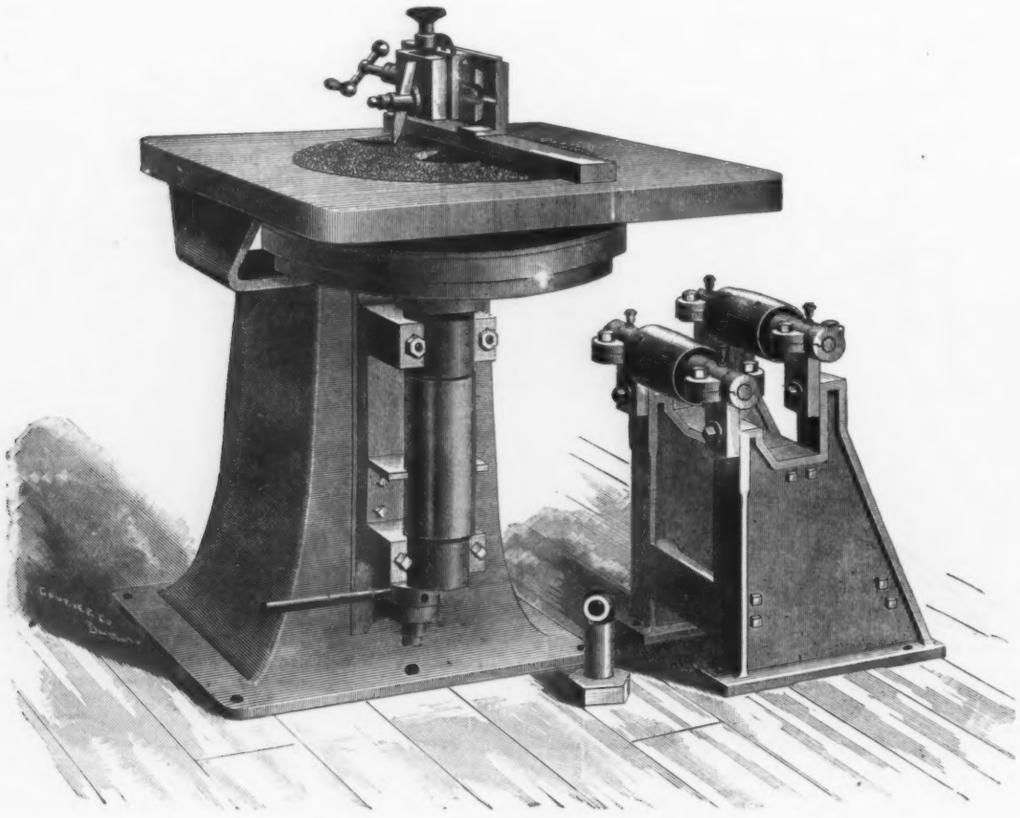
The engravings which we publish clearly explain the nature of the design und require but little description. The boiler consists essentially of two connected shells with a water space, W (Fig. 3), between them, and provided with inwardly and outwardly projecting water tubes T and T′, as large a number as can consistently be used being employed. The tubes are expanded into the shells, the inner ones, T′, having solid ends and being of a somewhat smaller diameter than the outer ones, T, so as to admit of their being readily introduced or removed through these should renewal become necessary. The outer tubes are for this purpose also provided at their outer extremities with screw caps which can be easily removed. There are no diaphragms or circulating plates in the tubes, the circulation, we are told, having been found in every way satisfactory and even more efficient without them, and no trouble from deposits being experienced. It is evident that the amount of heating surface which can be secured by the arrangement of tubes, as shown, is comparatively very large, a circumstance which explains, in a measure, the economy claimed. The shells are securely stayed and may obviously be made of any reasonable hight, according to the requirements for power for a given floor space. The furnace is located in the inner shell G, and the hot ascending gases thus first come in contact with the tubes T′ and then pass down into the space D between the outer shell and the jacket L (Fig. 2) on their way to the chimney flue, giving up the remainder of their heat to the tubes T. The iron jacket L and top sections L′ (Fig. 1) are made up of flanged sections, as shown, bolted together, and hold in place sections of asbestos, thus affording ample protection against loss of heat by radiation. Steam is taken off through the pipe S at the top, while the feed water is supplied through the pipe F. We need scarcely point out that in the design all the good features of the radial tube boilers have been retained and additional advantages secured.

With regard to the evaporative power of the boiler, a test made by the American Steam Boiler Insurance Company shows an evaporation from and at 212° of 12.498 pounds of water per pound of coal. A boiler similar in design is built for marine purposes. The works of the company are at Ravenswood, L. I.

A recent report of the Michigan Commission of Labor showed that the farms of that State are mortgaged to the extent of 20 per cent. of their value.

Emery-Wheel Surface Grinder.

The accompanying cut represents an emery-wheel grinder for surfacing work, especially adapted to pieces which can be held in the hand. In many cases they can be finished in less time than would be necessary to secure them to a face plate angle iron or to put them in a chuck. The engraving shows a slide rest set edgewise for using a diamond tool for trueing the wheel. It is easily removed when not in use and the cross bar to which it is attached is useful in steadying the work. The machine is 38 inches high. The base on the floor measures 30 x 26 inches, and the table is 30 inches square. The emery wheel is 20 inches diameter and 6½ inches deep. It is mounted on a 2½-inch steel spindle secured to a gibbed carriage running over dovetailed track and raised by a screw as the wheel wears away. The grinder is manufactured by the Springfield Glue and Emery Wheel Company, of Springfield, Mass.



EMERY-WHEEL SURFACE GRINDER, BUILT BY THE SPRINGFIELD GLUE AND EMERY WHEEL COMPANY, SPRINGFIELD, MASS.

Irrigating canals representing heavy investments of capital are fast becoming an important feature in the Western States and Territories. The latest scheme is that of Delegate Antonio Joseph, of New Mexico, who has introduced into Congress a bill to incorporate a great irrigation company for the Rio Grande Valley, and to grant the right of way for the necessary ditches, laterals and reservoirs. The company is composed of a number of the leading capitalists of New Mexico. The general course of the canal will be southward through the counties of Socorro, Sierra and Lenoa, and on the eastern border of the Messilla Valley to the State line of Texas; thence along the eastern border of the Rio Grande Valley to a point near or below the City of El Paso, Tex., to enable the company to extend its system into Texas and to operate in that State. It is expected to acquire an act of incorporation and the right of way from the State authorities. The capital stock of the company is placed at $10,000,000, and the limit of land asked for the right of way and privileges is 1,000,000 acres. The name of the corporation is the Journado and El Paso Reservoirs and Canal Company, and the general headquarters are to be located at Las Cruces, N. M.

Mr. Carnegie's Proposition.

In the month of December of last year the Edgar Thomson Steel Works, of Carnegie Bros. & Co., Limited, at Braddock, Pa., were closed down for the usual annual repairs. These repairs were completed in the following month, but in the meantime the employees were notified that when the works resumed operations it would be at a reduction of wages. It was set forth in the following proposition which was submitted to the workmen by the firm on February 9 last:

Common labor, 13 cents per hour.

Blast-furnace labor, 8 per cent. reduction. Furnace A to be gone over by Mr. Gayely and committee, but is not included in the positive 8 per cent. reduction.

All engineers and water-tenders, 8 per cent. reduction, but in no case shall wages be reduced below 1886 rates.

Transportation department to be untouched.

Steel department, 10 per cent. reduction.

Or the whole question of wages for 1888 to be submitted to arbitration.

The men agreed to submit the matter to arbitration, but stipulated that the scale adopted should only continue in force till July 1, 1888, while the firm insisted that it should continue in force till February 1, 1889. After several conferences were held in an endeavor to arrange the trouble, and both sides continuing obstinate, a strike was declared, with the result that every department of these works, including the seven blast furnaces, has been idle for more than three months. Recently a committee of three, consisting of Joseph L. Evans, B. F. Stewart and John Flannery, was appointed by the workmen to visit New York City, and hold a consultation with Mr. Andrew Carnegie, and endeavor to settle the difficulties existing between the workmen and the firm. Week before last this committee saw Mr. Carnegie, and returned to Pittsburgh with the following proposition, which however was not made public till Thursday the 29th ult:

MARCH 22, 1888.

Messrs. Evans, Stewart and Flannery:

GENTLEMEN—It has given me great pleasure to meet and confer with you freely to-day. My only regret is that every one of our men at the Edgar Thomson works was not present to hear every word that was said and to see what you have seen. At your request I summarize the important points:

1. You did not need further proof on my part to satisfy you that Bessemer pig iron could be made in Chicago quite as cheaply as at our works, and hence that cost of rails there was greater than with us only by so much as our fuel was cheaper. This difference is no greater than $1 per ton of rails—not one-third the cost of freight on rails to Chicago.

2. I showed you that rail freight from Chicago to Southwestern points was from $1 to $2 less from Chicago than from Pittsburgh—such points as Cairo, St. Louis, Kansas City, &c.—therefore that we find a hard task indeed to compete for Chicago, Northwestern or Southwestern business.

3. This being so, I think you agreed with me we could no longer run our works steadily unless we were placed upon an equality with Western competition as to labor.

4. It follows that we must do as our competitors do—viz., run two turns where and when they do so.

5. I showed you a statement of all our contracts for rails this year and also of those of all the steel-rail mills in the country up to the 1st of this month, and I believed you agreed

with me after seeing this statement that we could not hope to run our works to their full capacity this year.

6. You ask me to state my views as or what was best for our men and for us under present conditions—for I believe what is really best for the one is best for the other—and I give you as my reply a copy of an article published in the *Forum* in April, 1886, and asked you to read yourselves and also to relate to all our men. I wish our men and ourselves to become practically partners by paying them upon a monthly sliding scale based upon the price received for rails during the month preceding. This price to be reported by an agent chosen by the men each month at our expense. All documents bearing upon the subject to be handed over for his thorough inspection, to our chief bookkeeper, and also a member of the firm to swear to the correctness of the statement. I was asked by Mr. Stewart if the company was not paid for a lot of rails, whether the price to be paid the men would be effected thereby, to which I replied that the men would have nothing to do with any losses whatever. The company ran all risk of payment and paid the men for every rail made as heretofore.

7. I further stated that I had gone carefully over all our figures of labor, cost, &c., and decided that it would be fair and just for us to adopt the prices paid in 1885 as a basis of the scale. Rails that year netted us $27.50, this year so far $31.50; this would make wages to start with between 14 and 15 per cent. above those of 1885; common labor would be $1.

8. I said that in order to give the sliding scale a fair trial it would be necessary to make it binding the remainder of this year and for the years 1889 and 1890; but that if either party wished it to terminate at the end of 1890 notice must be given previous to October 1 of that year, when the scale would cease at the end of 1890, and I also said that in order that every man would be sure to read and understand the agreement, we would require every man to sign it individually and for himself, although we had no objection to any committee signing also, as a committee—we require every man's signature to prevent the possibility of any misunderstanding. I also said that of course our managers would select such men as they desired to serve under them, and that we thought it only proper to provide that common labor should not go below $1 per day.

This is not presented in a spirit of antagonism to the men. I do not expect them to see as I do that such an arrangement is for their permanent good until they have had ample time to consider the subject as I have, but I do have abounding faith that such will be their conclusion after a time, and such their experience after two years' trial.

In conclusion, I expressed to you the opinion that if our men and ourselves were thus placed in the same boat, sharing adversity and prosperity together and standing shoulder to shoulder in loyal co-operation, that it would be a cold day after this year when the Edgar Thomson works would again be stopped for want of orders as long as orders were to be had.

Thanking you for your call, I am sincerely yours, ANDREW CARNEGIE.

The publication of this letter, of course, caused considerable of a sensation, and much speculation was indulged in as to how it would be received by the workmen. Immediately on its reception, a meeting of the workmen was held in Braddock, and after a number of addresses had been made for and against acceptance of the proposition, it was decided to refer the whole matter to a committee of 12, who will hold it under advisement and make a report in a few days. It is reliably stated that a majority of the workmen are opposed to the acceptence of the proposition, the principal objection being the proposed return to the 12-hour system. There is no doubt but that it will be known during the present week whether the proposition is accepted or rejected.

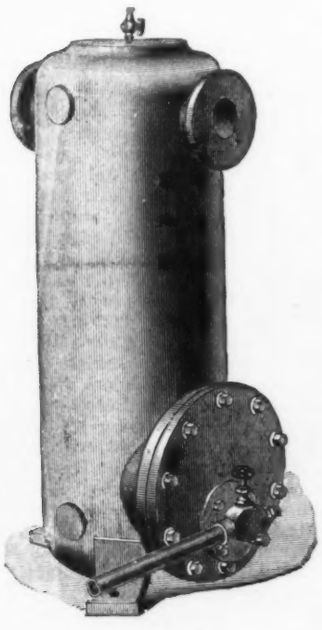


Fig. 1.—Elevation.

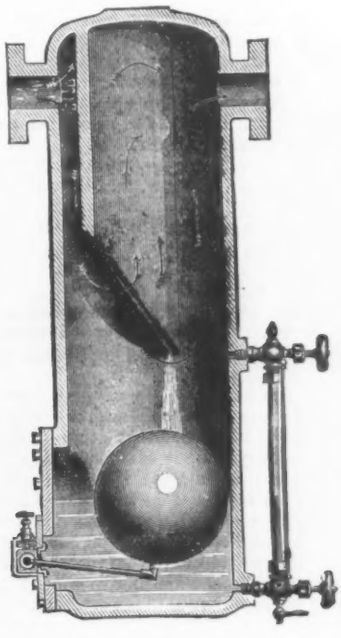


Fig. 2.—Vertical Section.

COMBINED STEAM SEPARATOR AND TRAP, MADE BY THE CURTIS REGULATOR COMPANY, BOSTON, MASS.

High-Speed Gearing.—During the last few years, and particularly since the adoption of double-helical teeth, a great increase has been made in the speed at which heavy gearing is run, and in many cases there are now successfully adopted speeds which in former days would have been regarded as utterly impracticable. As a striking instance of this the London *Engineer* cites the case of a pair of double-helical wheels at the works of Messrs. R. Johnson & Nephew, the well-known wire-drawers of Manchester. These wheels are 12 inches wide on the face by 6 feet 3 inches in diameter, and they have now been running for over a year at 220 revolutions per minute, the pitch-line speed being thus 4319 feet per minute. Notwithstanding this enormous speed, the wheels run with scarcely any noise, and their working has been most satisfactory.

The American Metal Company, Limited, announce their removal to 80 Wall street, this city.

Combined Steam Separator and Trap.

For removing entrained water and water of condensation from steam-pipes, the Curtis Regulator Company, of Boston, Mass., are now putting on the market an ingenious form of steam separator and trap combined. Through the courtesy of Mr. Amos Aller, 109 Liberty street, New York, we are enabled to present the accompanying engravings of the device.

It will be seen that the steam, in its passage through the separator—which is a heavy casting—is sharply deflected downward and then as sharply deflected upward. Steam, being a highly elastic fluid, readily accommodates itself to these changes of direction, while the water and solids carried along with it, by their momentum continue onward instead of turning with the steam and are projected against the face of the deflector, and, gradually falling as they lose their momentum, are gathered in a stream against the rear side of the deflector and flow downward to the base. It will be observed that the lower edge of the deflector plates are trimmed to such an angle that the drops and streams of water and grease will cling to the plate until they reach the point of contact with the shell, and then, being entirely out of the current, flow quietly to the bottom. Any of the lighter particles of matter that may have remained in the steam current after the first turn are simply thrown out in the next, and shower down as fine spray against the bottom and sides of the shell. The separation is claimed to be perfect. The water in the base is removed by a balanced float trap the same in design as that described in *The Iron Age* of September 1, 1887. The valve is double seated, and the float is of composition metal, perfectly round and very stiff, and warranted for 150 pounds pressure. Through the stem and center of the valve the interior of the float is in communication with the atmosphere, insuring it against filling with water. The valve area is very large, and there is a pass-by valve by which the whole can be blown out at will. A glass water gauge at the side shows the water level at a glance. The sediment being heavier than water settles to the bottom, and can be removed at pleasure by taking off the side cover, which removes the float, and exposes the interior to inspection. The grease being lighter than water floats on the surface, and can be drawn off at intervals through a grease cock which can be located at the water line of the trap if required.

The apparatus is turned out in five sizes, ranging from 30 to 60 inches in hight, and designed for steam inlets of from 2 to 8 inches in diameter. We may add that it is in extensive use by the Boston Heating Company, at Boston, being fitted in the lines of the consumers' branch pipes, and serving the purpose of an expansion chamber for expanding the highly heated water into steam. The apparatus accordingly is very aptly termed "converter" by them. The advantages which it offers over the ordinary forms of separators which must be drained by opening and closing cocks are readily apparent.

Celluloid has recently been used as a substitute for copper in sheathing the hulls of vessels, and has been found to answer the purpose admirably. In the experiments performed with it, plates of celluloid were applied to a number of vessels and allowed to remain for six months. At the end of that time the parts of the hull left uncovered were found to present abundant collections of marine vegetations, while the celluloid was quite intact and free from yet any such vegetable masses. It can be applied to the hull in extremely thin plates and yet supply all demands for solidity, impermeability, resistance to chemical action, &c.

Chemical and Physical Properties of Boiler Plate.

BY WM. H. MORSE, M.D., WESTFIELD, N. J.

A series of laboratory tests, undertaken to determine the value and distinctive strength of boiler plate, has afforded so much interest to the observer that it is thought not improbable that the formal report of the same may be of some import to consumers, if not because of scope and extent, at least because of the fact that the specimens submitted were examined without the cognition of the manufacturers, and under a system of notation which did not admit of preidentification of specimens. It is not necessary that there should prefatorily ensue a discussion of the connection between the physical properties of iron and its chemical composition; it is enough that we recognize the fact—too often lost sight of—that the result of the analysis tends to lend additional worth to the appreciation of physical tests. Until one institutes analytical investigation he does not gain a perfect knowledge of the variations in the physical qualities of the iron. I doubt if it is until then that he fully understands that, while variation may be due to treatment in manufacture, it is also due to a difference in ferric composition, and to both causes combined. To determine the detail of the specific causes of variation, I have found it indispensable to make one class of altering conditions vary largely while the other classes were kept uniform, and then vary another, and so on, until the value of each is determined. There were under consideration nine specimens, notated as A, C, E, G, I, K, M, O and R, respectively, and were reputed to the purchasing agent as "of such purity and refinement as are deemed indispensable to consumers." The directions were given "to obtain at least 12 leading qualities." Circumstances rendered nine specimens sufficient. The table shows the tensile strength, reduction of area and relative values:

Tensile strength. Per square inch.	Reduction of area. Per cent.	Values.
A.—60,050 pounds	38.0	T2. R2.
C.—56,673 pounds	31.8	T4. R6.
E.—54,320 pounds	33.0	T5. R5.
G.—63,590 pounds	43.7	T1. R1.
I.— 50,765 pounds	30.6	T9. R7.
K.—51,130 pounds	29.8	T8. R8.
M.—52,533 pounds	36.5	T7. R3.
O.—58,050 pounds	29.0	T3. R9.
R.—53,107 pounds	34.7	T6. R4.

It will be noted that the specimens A, E, G and K are each of the same order of value as regards tensile strength and reduction of area. C and O are more valuable in reduction of area, while I and R have their highest valuation in tensile strength. There is an interpretation to be placed on this. G, A, E and K are valuable in the order named, physically. Now as to the chemical characterization:

	Slag.	Nickel.	Cobalt.	Manganese.	Copper.	Carbon.	Silicon.	Phosphorus.
G	0.33	0.01	0.008	0.01	0.009	0.02	0.09	0.07
A	0.44	0 18	0.07	0.02	0.035	0.04	0.11	0.22
E	1.76	0.12	0 02	0.03	0.32	0.05	0.16	0.19
K	1.07	0.03	0.03	0.006	0.04	0.04	0.09	0.09
C	0.72	0.02	0.02	0.03	0.01	0.08	0 14	0.20
O	0.45	0.04	0.02	0.02	0.05	0.06	0.14	0.15
I	....	0.08	0.03	0.02	0.04	0.04	0.15	0.16
R	....	0.042	0.042	0.04	0.006	0.08	0.16	0.19

The best of these irons average, phosphorus, 0.07, while the other extreme is 0.22. The investigations have, however, been made so difficult by the general purity and chemical similarity of the specimens that the effects cannot be independently traced. As for the silicon, I do not regard it as affecting either tenacity or ductility. Good steels are made with as much as 0.20 silicon; but, of course, the fault may be silica instead of silicon. In my tests, however, the slag (which contains the silica) was separately estimated. (Does iron differ from steel in this respect?) The extremes of silicon were 0.09 (G and K) and 0.16 (E and R). Apparently an excess of this element means a decrease of strength. Carbon occurred with beautiful uniformity, the range being only 0.02 to 0.08. Wm. Hackney (1875) showed the amounts of carbon in various well-known steels and irons. Let me quote him:

Crown Boiler plate steel	0.22 to 0.24
Fagersta steel	0.08
Swedish iron	0.087
Krupp steel	0.18

Carbon may not measure full fitness, however. Manganese is too low to evidence effects. Copper at highest is only 0.035, and nickel does not exceed 0.13. The range of slag is (seven specimens) 0.33 to 1.76. It is lowest in G., which had 63,590 pounds tenacity, and highest in N., which had 54,320 pounds tenacity. What is the matter, is it slag that weakens, or is it dirt? I cannot answer, unless at a future test I provide some specimens made purposely dirty.

What are the conclusions to be cited to benefit makers and users?

(1) The irons were all very much alike in composition, and the effects of carbon and phosphorus are obvious.

(2) Phosphorus up to 0.10 per cent. does no harm. Only G. and K. were below that amount.

(3) Strength is varied more by reduction of area than by composition (see the tables).

(4) The analyses, made in connection with the physical tests, are indispensable to determine both character and treatment, showing that strength is dependent on reduction.

(5) Proofs are made of heterogeneity, and the way of radical improvement may therefore not be other than obvious. Predicating all upon these several conclusions, and noting the facts brought forward, I consider that the best American boiler plate available was that noted G. It has the highest tenacity (63,590 pounds); the highest reduction of area (43.7 per cent.); the least slag (0.33 per cent.); the least phosphorus (0.07 per cent.); the least silicon (0.09 per cent.); the least carbon (0.02 per cent.), and the least nickel (0.01 per cent.), and manganese (0.01 per cent.).

I cannot refrain from adding one more table in apposition of answer to the questions—What have modern processes procured? and, Is English boiler plate superior to American?

The following table shows the physical qualities and chemical value of (1) the G. iron above named, (2) the best English boiler plate and (3) the piece of iron found under the obelisk now in Central Park, New York:

	(1)	(2)	(3)
Tenacity	63,590 lb.	50,000 to 60,000 lb.	....
Reduction	43.7 P.C.	Av'ge 37.50 P.C.	.....
Phosphorus	0.07 P.C.	0.10 to 0.22 P.C.	0.048 P.C.
Silicon	0.09 P.C.	0 10 P.C.	0.017 P.C.
Carbon	0.02 P.C.	0.5 P.C.	0.521 P.C.
Copper	0.009 P.C.	0.1 P.C.	0.102 P.C.
Manganese	0.01 P.C.	.....	0.116 P.C.
Cobalt	0.008 P.C.	..... }	0.079 P.C.
Nickel	0 01 P.C.	..... }	
Slag	0.33 P.C.	0.75 to 1.87 P.C.	0.150 P.C.
Sulphur	.....	.....	0.009 P.C.
Calcium	.....	.....	0.218 P.C.
Aluminium	.....	.....	0.070 P.C.

We may add to the above report that it was made without the knowledge of any of the makers, and that Dr. Morse states that the specimen G, which he pronounces to be superior, was made by Messrs. Wm. McIlvain & Sons, of Reading, Pa.

Mr. L. Martin, of 194 Greene street, New York, has for many years been engaged in carrying out artistic work in sheet metal, a number of repoussé medallions having been made by him in the past for the dining-room of the mansion of Mr. Cornelius Vanderbilt. Mr. Martin is now engaged in completing two metallic boats which call for the skill of the hammer which he has developed. They are made only of two strakes, with an iron keel, all riveted. The sheet metal is shaped by hand and the entire job carried out so that the minimum of riveting is necessary. Mr. Martin manufactures life-boats on the same principle.

A Clever Piece of Engineering.

On the 26th ult. quite a feat was accomplished at Chicago under the direction of Charles L. Strobel, consulting engineer of the Keystone Bridge Company. Mr. Strobel took a contract some time since to remove the Wells street drawbridge to Dearborn street, two blocks down the river, with the Clark street bridge intervening. He very carefully figured out the problem, and the splendid success of the achievement is proof of the correctness of his calculations. The bridge structure weighed 110 tons, but Mr. Strobel denuded the framework, which is of iron, of all the wood flooring and superfluous hand-rails and other incumbrances, so that the frame only remained, and this weighed 90 tons. Every bolt and nut was carefully examined, oiled and tightened. Then four huge scows were secured, partially sunk by being filled with water, and horses or scaffolds erected on each pair. These were floated under the bridge at each end, and the water pumped out of the scows by the tugs Alert and Allen. It was 5 o'clock when the bridge began to feel the scaffolds rising underneath, and it was 5.25 when the bridge swung free from its moorings at Wells street, where it has been since 1872. The iron structure was in first-class condition, and is a credit to its builders, Fox & Howard. The novel vessel floated gently with the current, one end being held until the other had gotten straight with the river. The tug Allen went to the bow, and the trip to the Dearborn street pier began. There were thousands of people on the wharfs, docks and street intersections watching the strange craft. It reached Clark street at 5.55 o'clock, and 25 minutes later it safely passed the drawbridge at that point. It took some careful steering to get the craft down the river across the Dearborn street pier, and it was just 6.55 o'clock when the feat was fully accomplished, and the Wells street bridge was henceforth to be known as the Dearborn street bridge. It took just 1 hour and 30 minutes to make the trip, and there was not the slightest hitch in the job from first to last. Mr. Strobel rode on the bridge, and had entire charge of the work. Work has begun on a new bridge for Wells street, which is to be of double the capacity of the old one, the change being demanded by the great increase in traffic in that portion of the city.

Representatives of about 40 different industries and business interests of Milwaukee, met on the 27th ult., under the auspices of the Merchants' Association, and decided to take vigorous measures to "boom" the city. They effected an organization for the purpose, as follows: John A. Goodrich, president; George J. Obermann, vice-president; William Plankinton, treasurer; C. M. Treat, secretary. The advantages of Milwaukee for the establishment of manufacturing enterprises will now be brought to the attention of the residents of other sections of the country. It is generally conceded that it will not do in these bustling days to depend upon gradual or natural growth. Ambitious towns must advertise their advantages if they wish to make themselves important in the business world, just as individuals are obliged to manage their personal affairs.

New Presses for Sheet Metal Work.

We present in this issue two machines of improved construction for the manufacture of sheet metal goods, built by the E. W. Bliss Company, of Brooklyn, N. Y. In the automatic drop press shown in Fig. 1, the object aimed at has been to secure a machine that for simplicity of construction, convenience and safety of operation and durability would be as nearly perfect as possible. While in some respects the press is similar to that which we illustrated in *The Iron Age*, of February 24, 1887, there are important modifications which will presently appear. The bed fitted with forged poppets and cast steel screws for holding the die is similar in construction to those in ordinary use. Two heavy adjustable guides with broad base are each secured to the bed by four holding bolts provided with check nuts. The main feature in this press is the lifting device, which is secured to the top of the guides, making the machine compact and complete in itself. It consists of two lifting rolls which run continuously, the main shaft carrying the back roll, while the front roll is mounted on a swinging frame pivoted at the top, and hangs obliquely in such a manner that the front roll is pressed against the other by its own weight and that of the swinging frame. The lifting belt passes over the front roll and down between it and the back roll, thus obtaining a friction surface of one-half the circumference of roll, in addition to the pressure between the rolls at the point of contact. It will be seen that, by this arrangement, the weight of the hammer increases the friction between the rolls and adds to their lifting power, so that the heavier the hammer the greater will be the lifting power. By this device it is claimed that less than one-fourth the pressure between the rolls is required than when a board is used instead of a belt, and the consequent reduction of pressure lessens the wear in the shaft bearings. Narrow expansion collars of composition metal run loosely on the front shaft at each end of the lifting roll. These raise the belt clear of the roll when the hammer falls, thus preventing friction that would retard the fall of the hammer. In the recess in the right-hand guide an upright sliding rod is provided with a wedge-shaped top, the lower end resting on a steel pin. When the hammer is raised it strikes an adjustable dog attached to the rod and forces the wedge between the roller shafts, parting the rolls and releasing the hammer. As the latter descends it drives back the steel pin and allows the wedge to drop, thus bringing the friction rolls together and raising the hammer. The hight of lift may be quickly changed to suit different kinds of work, and when the hammer is not in motion it rests on a latch shown on the left guide. The operation of the machine is under perfect control of the operator.

Fig. 2 shows a new double-action geared press, designed especially for the use of manufacturers of articles in the line of tinware, brass goods, lamps, burners, &c. It has a motion of 6 inches on the plunger and 3 inches on the blank holder, and will receive a punch 6 inches in diameter and a blank 11 inches in diameter. It has a strong arched frame mounted on a heavy iron table. The forged steel crank-shaft is provided with two wide cams of cruci ble steel with rectangular openings fitted to the shaft in such a manner as to prevent their working loose. The heavy gear on the outer end of the crank-shaft is driven by a pinion on a back-shaft, and upon this back-shaft is mounted a heavy fly-wheel with tight and loose pulleys. The blank holder slides in long V-shaped guides made adjustable to take up wear, and to operate cutting as well as drawing dies. The adjustment as to hight is effected by means of two steel screws, one on each side directly underneath and in line with the cam rolls. A new clamping device prevents the blank holder from getting out of adjustment, and thus prevents the lengthening of connections and consequent breaking of stock or springing the shaft, which is liable to happen when

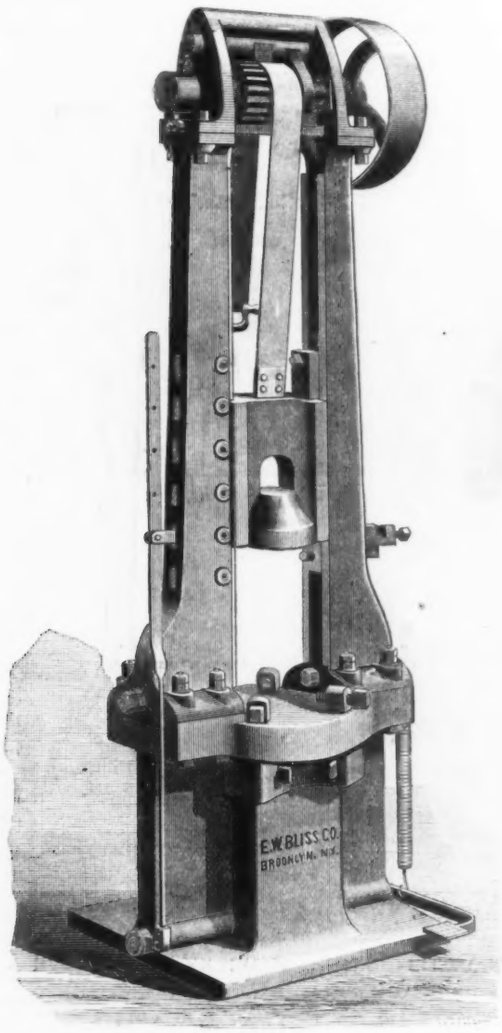


Fig. 1.—Improved Automatic Drop Press.

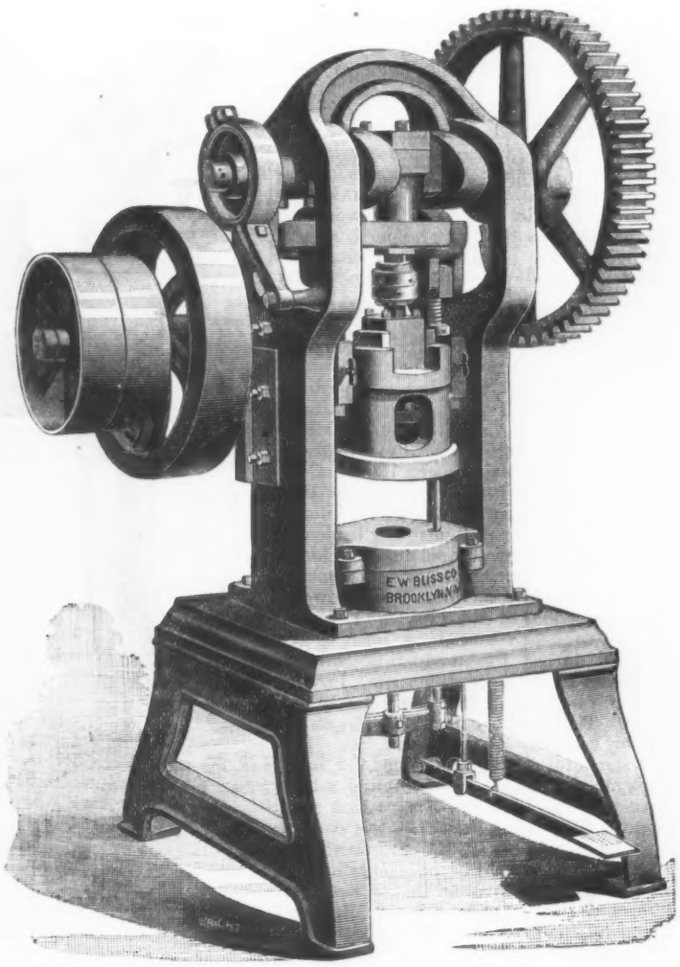


Fig. 2.—Double-Acting Drawing Press.

NEW PRESSES FOR SHEET METAL WORK, BUILT BY THE E. W. BLISS COMPANY, BROOKLYN, N. Y.

the adjustment is not properly maintained. Motion is communicated to the blank holder from the cams on the crank-shaft acting directly on cast-steel rolls, which are bushed with composition metal and run on tool-steel pins mounted in a yoke, to the lower side of which the blank holder adjusting screws are attached. A new device has been introduced for raising the blank holder. It consists of a cast-iron rocker mounted on a shaft on the press frame back of the main shaft. On a projecting arm on the outer end of the rocker a roll is mounted, against which a cam on the outer end of the main shaft acts, communicating motion to the rocker. Two arms on the rocker connect with the blank-holder yoke in such a manner that the blank holder is raised when the crank is on the upper stroke. The drawing plunger is operated by a crank on the main shaft, and, being rectangular in shape and accurately fitted to slide in bearings inside the blank holder, is specially adapted for drawing oval, oblong, square or any irregular shaped work. It is quickly adjusted as to hight by the use of a new device, which dispenses with the use of the ordinary large wrench. Connected with the blank holder of the press is a lifting device that raises the work out of the die when the blank holder is raised. Altogether the press is a very compact, substantial and well-built machine of its class.

The second cable street railway system in Chicago was formally opened for public service on the 26th ult. It covers with its network of main tracks and auxiliary horse-car branch lines the north side of the city, embracing the territory north of the Chicago River to the city limits. Connection is made with the heart of the city through a tunnel under the river, known as the La Salle street tunnel, the cable extending through the tunnel and six blocks beyond it, penetrating the business section and affording a means of transit between the two sections of the city which is not subject to delays caused by open drawbridges during the navigation season. There are 14 miles of cable used in this system, run by five 2000 horse-power engines. This improvement cost the street railway company about $4,000,000. The first shovelful of dirt was turned for it in September, 1886, so that a year and a half have elapsed since its construction was begun. The delay, however, was caused by outside matters and cannot properly be attributed to difficulty of construction. The corporation owning this system are known as the North Chicago Railway Company, and are largely composed of Philadelphia capitalists, one of whom, Charles T. Yerkes, now resides in Chicago and personally manages their affairs as president of the company.

The Mékarski system of street car propulsion by compressed air, referred to in *The Iron Age* when first proposed, has been put to practical use in London, England, horses having been dispensed with on one of the lines. The system embraces a station where the air is compressed and stored for delivery into reservoirs placed under the cars. The air in its passage from the reservoirs to the driving engines, which are also under the cars, passes through hot water and steam, which are charged into a receiver on the car at the compressing station. The heat prevents the formation of snow in the cylinders which would ordinarily result. The working line is about two miles in length, and has several heavy grädients and sharp curves. The Mékarski cars, which resemble the ordinary horse-drawn cars, take their turn regularly with the other cars on the line, keeping time and observing all the other conditions of traffic.

Adjustable Exhaust Steam-Induction Condenser.

We illustrate on this page the most recent form of exhaust steam-induction condenser, made by Messrs. L. Schutte & Co., of Philadelphia, Pa., being of adjustable capacity. A necessity for adjustable capacity arises when the condenser has to lift its own water supply, and when at the same time the work is variable. When the condenser has to supply its water under suction it must not be of too large a capacity, on the grounds that an excessive volume of water reduces the tension of the exhaust below what is required to maintain and discharge the current of water; therefore, the capacity must not exceed a certain size, so as to retain the propulsive effect of the exhaust due to tension, and which is always the difference between vacuum obtained and an absolute vacuum. This admissible vacuum has been found to be from 24 to 25 inches of mercury. As it may be difficult to determine the exact duty of an engine and consequently the suitable size of condenser within limits, this adjustable feature will at once appear desirable, and it is equally so when economy in the use of water is a condition, or where a prospective increase in power is to be provided for, so that if an adjustment can be had the condenser can always be as most advantageous for the work required.

It is in all cases preferable to have the water flow to the condenser, and if such condition can be secured the machine will start readily with but 1 foot of head and without the need of a tail-pipe below or a tank above. If the water has to be lifted, a live steam jet or a pressure water jet is employed to bring the water to the condenser, and, after starting, this jet can be closed and the action of the exhaust steam alone will continue to induce and discharge the water as long as the exhaust steam supply continues and the air is excluded (which means tight connections and stuffing boxes).

In the sectional view, Fig. 2, the hand-wheel B operates a screw, which raises or lowers a ram, and by this means adjusts the water conduits to the proper size. The valve D is a check-valve, which opens outward and facilitates the escape of steam when starting, and thereby gives increased suction power. Where the condenser is used with water under a fall, or with very low suction only, the valve D is not required, and it can be removed and the opening closed by a plug. In Fig. 3 we show a section of an automatic exhaust valve which is intended to connect directly to the condenser or anywhere in a line of horizontal exhaust pipe. The valve, with the present position of lever, is free to open or close by the action of the exhaust steam, and simply acts as a check-valve, which is kept closed by the effect of a vacuum in the exhaust pipe, but is free to open when the vacuum is destroyed. By turning the handle to the right it is permanently suspended, for the purpose of preventing a continuous opening and shutting with each stroke when the engine is exhausting into the atmosphere. By turning the handle to the left, after removing the pin, the valve can be permanently closed.

Fig. 1.—General View.

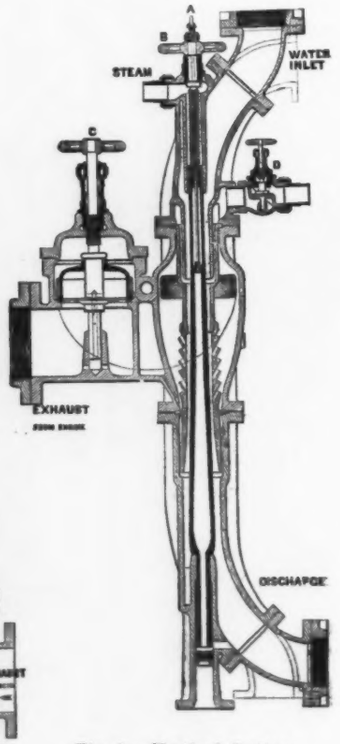


Fig. 2.—Vertical Section.

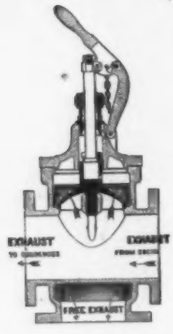


Fig. 3.—Automatic Exhaust Valve.

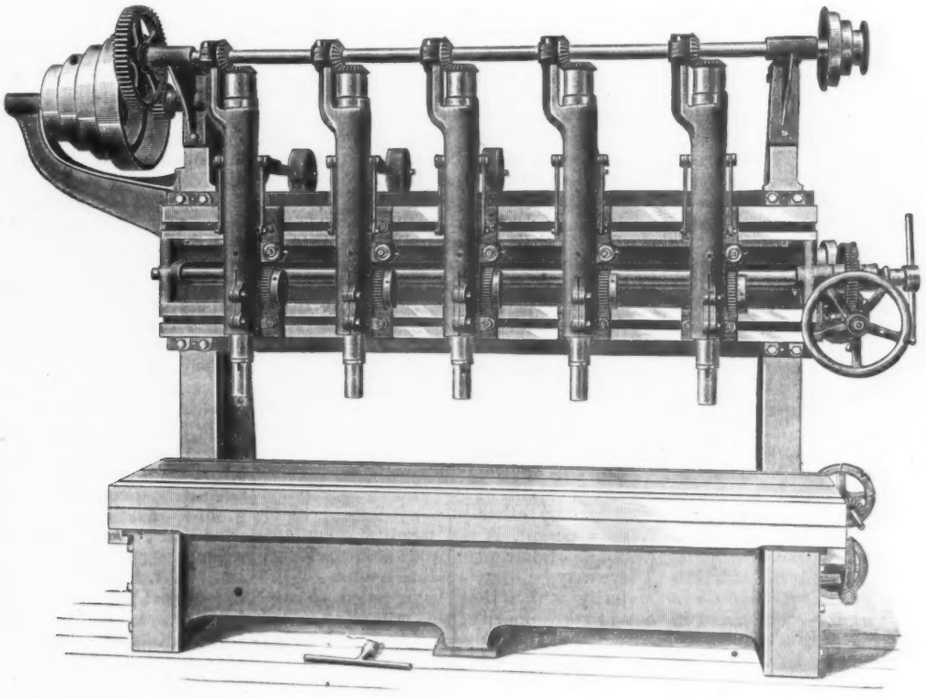
EXHAUST STEAM INDUCTION CONDENSER, MADE BY L. SCHUTTE & CO., PHILADELPHIA, PA.

Recent statistics of the amount of steam power in use in different parts of the world make it appear that the United States consumes more power from stationary engines than any other country, the figure being placed at 7,500,000 horse-power, as against only 7,000,000 horse-power in England, 4,500,000 in Germany; 3,000,000 in France, and 1,500,000 in Austria.

New Five-Spindle Drill.

Messrs. Prentice Bros., of Worcester, Mass., are putting on the market a new form of multi-spindle drill for use in boiler and machine shops where a number of holes are to be drilled in a line certain distances or any equal distance from each other. The engraving which we publish explains the nature of the design.

The heads are arranged on the cross-bar so as to be instantly moved horizontally to any position on the bar by means of a rack and pinion. When the heads are close together they will drill holes eight inches apart. The machine has a traverse of spindle of 12 inches, and the greatest distance from the end of the spindle, when the latter is at its greatest hight, is 18 inches. Each spindle is perfectly balanced and supplied with quick return motion, and by means of a friction arrangement in connection with a rack and pinion, an independent feed of each spindle is obtained. There are three changes of feed, and a change of gears can be supplied so as to give any feed desired. The machine is capable of drilling five 1 to 1¼-inch holes at one time. The tables are arranged so as to move out from the standard a distance of 8 inches by means of a worm and worm gear in connection with the rack and pinion. There is also a longitudinal movement of table of 24 inches, operated by means of a pair of bevel gears and a screw in connection with a hand wheel which is graduated and supplied with a stop. Each notch in this wheel represents a longitudinal movement of the table of $\frac{1}{16}$ inch, while a complete revolution will move the table ¼-inch. By this arrangement holes can be drilled and correctly spaced any distance from each other. The patterns are made so that any length of frame desired can be supplied, and with as many sliding heads as may be required. The machine which we illustrate requires a floor space of 12 feet 6 inches, and the weight is 9200 pounds. A countershaft and all necessary wrenches accompany it.



FIVE-SPINDLE DRILL, BUILT BY MESSRS. PRENTICE BROS., WORCESTER, MASS.

In the *Zeitschrift des Vereines Deutscher Ingenieure*, of March 10, 1888, are published details of a triple expansion mill engine designed by Mr. W. Theis, of Palermo, Sicily. The cylinders are horizontal, and the three cranks are placed at angles of 120°. An ordinary slide valve is fitted to the high-pressure cylinder, while the intermediate cylinder has a Trick valve, and the low-pressure a double-ported valve. The engine is rated at 120 horse-power and is, in all respects, an interesting specimen of modern steam engineering.

NEW PUBLICATIONS.

HANDBOOK FOR ENGINEERS, ARCHITECTS AND OTHER WORKERS IN IRON AND STEEL. By J. C. Bland. Published by the Pottsville Iron and Steel Company, Pottsville, Pa.

Mr. J. C. Bland has compiled for the Pottsville Iron and Steel Company a series of tables on the capacity of the wrought iron and steel beams, iron and steel channels with explanatory chapters on determining their capacity and the use of the tables printed. The latter give for different spans, the safe load in net tons, the deflexion in inches, the distance apart in feet from center to center for safe loads in multiples of 25 pounds per square foot between 100 and 250 feet. A chapter is added on concentrated loading and on a method proposed by Mr. Bland of computing the absolute maximum bending moment on stringers due to the passage across them of a series of concentrated moving loads. A method of making computations for plate girders is followed by two examples carefully worked out, one for a single webbed and the other for a double webbed girder. In a similar way a chapter is worked out on buckled plates, on trussed girders, flitch beams and girders formed of beams. Tables are presented on the strength of hollow wrought and cast-iron columns, on the strength of square pine posts, followed by a mass of miscellaneous information; like tables on the carrying capacity of seasoned white pine beams; the shearing and bearing values of rivets; the bearing values and movements of resistance of pins; the weight of bar iron, flats, plates, rivets, bolts and nuts, machine bolts, sheet iron and steel, cast-iron pipe, welded tubes, spikes, timber, &c. The last series are a number of tables of weights compiled from various sources. The book is very handsomely equipped; is illustrated with plates of sections and views of the works of the Pottsville Iron and Steel Company, and is bound in Russia leather in the style usually adopted for engineers' pocket books of reference.

HANDBOOK FOR STEAM USERS. By M. Powis Bale. Size, 4¾ x 7½ inches; 95 pages. Published by Longmans, Green & Co., London. Price, 80 cents.

As a collection of useful facts for practical men, the above little book deserves popularity, its value as a convenient source of information, in a condensed form, pertaining to the different subjects coming under the head of steam using, being apparent on even a hasty inspection. The book was developed from a chart of rules prepared by the author for the use of engineers in the engine-room, and the favor with which this was received showed the evident appreciation which a more extended compilation of the same kind would encounter. The matter was, therefore, revised and enlarged, and chapters were added on steam engine and boiler management, explosions, &c., the whole subject being arranged in the form of paragraphs for easy reference. The chapters, of which there are four, are headed—"Rules for Engine Drivers and Boiler Attendants;" "Management of Steam Engines and Boilers" (engines and boilers separately), and "Explosions of Steam Boilers." These headings practically and faithfully outline the character of the work. The Chapter on Boiler Explosions, perhaps the only one which calls for any explanation, presents briefly the primary causes of such calamities, such as old age, over-pressure, defective design, &c., which themselves suggest remedies, and gives considerable prominence to an efficient inspection system, advocating compulsion in this respect. The importance of the subject lends special interest to this chapter, and a careful study of the facts presented would aid, in no small measure, to reduce the risk attached to steam generation and boiler attendance.

METAL SCHEDULE.

The Minority Report.

The report of the minority of the Ways and Means Committee, signed by W. D. Kelley, T. M. Browne, T. B. Beed, Wm. McKinley, Jr., and J. C. Burrows, contains the following argument in relation to proposed changes in the metal schedule:

TIN PLATES.

Tin plates are placed on the free list, although this country can make this essential article as easy as Great Britain, from which our supply is almost entirely obtained. Tin plates are composed of 95 to 97½ per cent. of iron or steel and 2½ to 5 per cent. of tin. This country has every facility for producing the sheets of iron or steel for tin plates, and it can buy from other countries the tin with which these sheets are coated. It is a mistaken belief that Great Britain obtains her supply of tin principally from Cornwall, in England. That country imports from other countries the larger part of her supply of tin, and this country now buys tin from the same countries, but not for use in the manufacture of tin plates, the present duty of 1 cent per pound being too low to enable us to compete with the tin-plate manufacturers of Great Britain. The world's supplies of tin are derived principally from Banca and Billiton, two Dutch islands in the Straits of Malacca; from Australia, and from Cornwall, in England.

In the five years ended May 31, 1885, the Straits and Australia supplied 156,832 tons of tin, and in the five years ended December 31, 1883, Cornwall supplied 45,672 tons. Since 1883 the imports of tin from the Straits into Great Britain have greatly increased, while the supply from Cornwall has only slightly increased, if at all. In the fiscal year ended June 30, 1887, this country imported tin plates valued abroad at $16,883,813. The bill of the majority not only proposes to continue this large importation annually, but makes public proclamation that this country does not want a tin-plate industry. If the majority had considered the interests of our own country, and not those of Great Britain, they would have recommended an increase in the existing duty on tin plates, so that our people would have been encouraged to engage in their manufacture and to develop the recently discovered tin mines of Dakota.

Free tin plates (or iron or steel sheets, or plates, or taggers iron coated with tin or lead, or with a mixture of which these metals are a component part, &c.) means no less than the annihilation of the manufacturing of the finer grades of sheet iron in this country, and upon which is expended the greatest amount of skill and best paid labor. The galvanized sheet-iron industry is especially threatened, and this is a great and growing manufacture, involving heavily invested capital in many States East and West. Free tin plates do not necessarily insure cheaper prices to the farmer or general consumer, but the duty taken off will be gladly absorbed by the foreign manufacturer, and this condition can be fully appreciated when the public will note that "free pig tin" has not insured against a most unheard-of heavy advance in price of this article in the hands of a foreign "combine," say, from about 20 cents per pound to as much as 38 cents per pound, within the last several months, and is now quoted on different futures as varying from 34 to 37 cents per pound, or being 75 or 80 per cent. advance, and this article so completely controlled by the French syndicate that the boast of the trust (as it may be called) is that this great advance can be maintained at its will.

This condition fixes also the advanced prices on all the good solder which so largely enters into the working of tin plate in the farmers' cans, &c., and for which the "tariff taxation" (so-called) is not chargeable. And here let attention be called to the fact that good (well coated with tin) tin plates have of late advanced very considerably to consumers, and for which advance the control by the foreign trust is wholly responsible, and it is further and well understood in well informed and reasoning mercantile manufacturing circles that tin plates would lately have advanced more largely without regard for the American manufacturers or consumers, or packers' or farmers' interests, except that the foreign syndicate has supplied the tin-plate manufacturers of England at much less price than to the outside world for the time being, so that tin plates need not just now be advanced to a point which might threaten and retard the effort to place such plates upon the free list, as proposed by this bill.

The sheet-iron and sheet-steel industry is placed in great peril by this bill.

COTTON TIES.

Cotton ties fare as badly as tin plates; they also are transferred to the free list. We now make cotton ties in this country in small quantities, and would make them in larger quantities if the duty on foreign cotton ties were higher than it now is. In the expansion of the cotton-tie industry in our own country the South ought to largely share, for it possesses all the raw materials of their manufacture, and the market for their sale and use is at its own door. But the bill of the majority announces that the manufacture of cotton ties is not to be tolerated in the North or established in the South, and that such machinery as we now possess for the manufacture of cotton ties is to be thrown upon the scrap heap. British manufacturers are invited to make all our cotton ties, and of course they will then charge us what they please for them.

Why this article, used for baling cotton, should be admitted free of duty, and when used for any other purpose dutiable at 1¼ cents a pound, is not manifest upon any principle of fair play or economic science. There may be some reason known to the majority which they have failed to disclose to the minority; we know of no reason why cotton should enjoy this extraordinary and exceptional legislative favor.

STRUCTURAL IRON.

Iron and steel beams and other structural iron and steel are forms of these metals which are largely used in the erection of public and private buildings, and in the construction of bridges, ships, &c. These forms are more expensive, because requiring more labor, than ordinary iron. Yet the bill of the majority recklessly subjects these more costly forms to lower duties than it imposes on ordinary bars of iron. The very low rates provided in the bill for beams and other structural forms of iron and steel will give great encouragement to the beam manufacturers of Belgium, which country now ships these products to the United States in considerable quantities.

STEEL RAILS.

If the majority desires to insure the handling over of our steel-rail market to our English rivals, the proposed duty of $11 will accomplish this purpose, unless the workingmen who are employed in producing the raw materials and finished products of our steel rail works are willing to accept still lower wages than they are now receiving, and the railroad companies who transport the raw materials are willing greatly to reduce their freight rates. Have the majority any assurance that the workingmen and the railroad companies are willing to accept these conditions? Neither were heard before the committee.

The supply of steel rails to the Pacific Coast is now in the hands of foreigners because of the cheap transportation by water from foreign ports, the existing duty of $17 not being sufficient to enable our manufacturers to compete for that trade. In the New York *Iron Age* for March 8, 1888, it is stated that the Atchison, Topeka and Sante Fé Railroad Company had lately purchased 10,000 tons of foreign rails to be delivered at San Diego, Cal., and it is also mentioned that another lot of 2500 tons of foreign rails had recently been sold by foreign makers for a Pacific Coast railroad.

In proposing seriously to cripple, if not to destroy, the manufacture of steel rails in this country the majority probably do not realize the full significance of the results which they invite. It should be remembered that our manufacturers of steel rails consume almost one-half of all the iron ore and almost one-half of all the pig iron that the country produces. If this great market for American iron ores and pig iron is to be destroyed the country need not be told of the distress which will come to labor and the bankruptcy which will come to producers.

PREFERENCE FOR AD VALOREM DUTIES.

A flagrant defect of the bill of the majority is its preference for ad valorem over specific duties, although the testimony of almost every Secretary of the Treasury since the foundation of the Government has been recorded against the frauds upon the Treasury which ad valorem duties invite and foster. Hon. Daniel Manning, the first Secretary of the Treasury under the present Executive, stated, in a circular letter, issued July 17, 1885, that "investigations of the methods of entry and appraisement of imported merchandise have shown that the tariff laws are largely evaded by undervaluation wherever the duties are levied ad valorem." In a subsequent special report on the revision of the tariff, dated February 16, 1886, the same official elaborately presented the objections of many of his distinguished predecessors against ad valorem duties, upon the ground that they encouraged fraudulent entries of imported goods. In closing his report the Secretary said: "One hears it often said that if our ad valorem rates did not exceed 25 or 30 per cent., undervaluation and temptation to undervaluation would disappear, but the records of this department for the years 1817, 1840 and 1857 do not uphold that conclusion. Of course I am very far from advocating the universal application of specific rates, but I do believe it to be possible for the more experienced and conscientious of our appraising or examining officers in different parts of the country, and for the experts in this department, to prepare a plan for the prudent enlargement of specific rates, which will greatly promote the welfare of the Government of the country."

Notwithstanding this deliberately expressed opinion by one of the most painstaking of our Secretaries of the Treasury, the bill of the majority continues many of the objectionable ad valorem rates of the present tariff and introduces others. Here, again, we detect a manifest purpose to favor foreign manufacturers at the expense of our own people, for if ad valorem duties have so operated in the past as to encourage fraudulent importations of foreign goods they may be expected to do so again. The majority must have known, for instance, that on steel wire rods entered at ad valorem rates the invoices have been systematically undervalued during the past two years, so much so that the importations of steel in this form have in the period mentioned been enormous and entirely unprecedented. In the fiscal years 1886 and 1887 the imports of steel wire rods under ad valorem rates amounted to 200,728 tons.

As this country possesses ample facilities for the manufacture of steel wire rods, there must have been some special cause for the larger part of the heavy importations of the two years mentioned, and this cause is found in undervaluations. Instead of proposing to prevent the evil of undervaluations in the future by substituting specific duties, the majority recognize and condone it by recommending a continuance of the ad valorem system which has made it possible. In this matter the majority not only favor foreigners at the expense of our own people, but they strike a serious blow at an honest administration of our customs laws.

Other features of the metal schedule of the bill of the majority are just as objectionable as those we have mentioned. Many of them would increase importations, and thus increase the surplus. The importations of iron and steel have been so large in the last two years—amounting to nearly 1,800,000 tons in the calendar year 1887, the foreign value of which was nearly $50,000,000—that further encouragement to foreign iron and steel manufacturers to ship their produce into our markets, as provided in the bill of the majority, is a matter of such serious moment that the attention of the country needs to be specially directed to it, and to the sweeping destruction which would be sure to follow in its path.

The Majority Report.

STEEL RAILS.

In the metal schedule the most important reduction is in steel railway bars, which are now dutiable at $17 per ton, and by the proposed bill at $11 per ton. This is a reduction of about 35 per cent. ad valorem. This reduction will be of great value in promoting and cheapening the construction of railroads and lowering the rates of transportation of freight. The rate of duty allowed by the committee is more than enough to compensate our manufacturers for the differences in cost between the American and foreign products.

While we have been constrained to leave high duties on almost all the articles we have touched—duties higher than any necessity either of revenue or of difference of cost of American over foreign products required—we have felt that we ought to give some relief to other branches of industry not benefited by high duties imposed for private purposes.

TIN PLATE.

A large number of our people are interested in manufacturing tin, and others in putting up meats, fish, fruit, vegetables, oils and other articles in manufactures of tin. Many of these products are exported and many consumed at home. During the last fiscal year there were imported into the United States 570,643,389 pounds of tin plate, valued at $16,883,813.95, on which duties were paid amounting to $5,706,433.89. We are informed that the value of the salmon caught in the Columbia River, Ore., and canned and exported during the last fiscal year, amounted to nearly $200,000, while the lard that was canned and exported exceeded $14,000,000, and the fruits and meats exceeded $4,000,000.

We believe that the removal of the duty on tin plate would reduce the cost of these and other canned goods, now being exported and give to our people now engaged in that trade such an advantage in the foreign market as would effectually overcome all competition and enable them to hold the market and build up a large foreign trade.

The exporter, under existing law, has a drawback of 90 per cent. of the duty paid on tin plate, but the repeal of the duty would give him the remaining 10 per cent. and enable him to sell so much lower and give him additional advantage over his foreign competitor. Besides this, the consumers of canned goods at home would obtain them at a reduced price.

The manufacture of tin cans is growing into an extensive industry in the United States. More than 150,000,000 cans are made per year in the city of Baltimore alone, while New York, Philadelphia, Chicago and other Nothern cities produce large quantities of articles manufactured from tin plate.

COTTON TIES.

We have placed cotton ties also on the free list. The duties received from them during the last fiscal year were $121,098.99. Cotton is our largest exporting product. The price is so low, and has been for a number of years, that it hardly pays the cost of producing it, and the committee felt that it was a proper subject for consideration while they were repealing taxes and reducing the surplus revenue of the government.

The representatives of the blast furnaces and other iron manufacturers of the Lehigh Valley held a largely attended meeting at Easton, recently, to consider the present general unsatisfactory condition of their business as manufacturers. Frederick A. Prime, of Philadelphia, was chosen president, and Hon. William H. Ainey, of Allentown, secretary. Of the 40 blast furnaces in this region all were represented at the meeting except the Carbon Iron Company. A committee of seven interested in the blast furnaces was appointed to lay the situation before the proper officials of the different railroad and coal people, and a similar committee of three, representing the rolling mills and other iron manufacturers, was appointed to cooperate with the furnaces in seeking some practical relief. It was stated that the general situation might be summed up in the fact that more than two-thirds of the furnaces in the Lehigh Valley had been forced into idleness by the generally unsatisfactory condition of the iron business in the valley, and those that were running were doing so at a loss. The committee representing the furnaces is as follows: William H. Ainey, of the Lehigh Iron Company and Coplay Iron Company; John Thomas, of the Thomas Iron Company; Joseph C. Kent, of the Andover Iron Company; Geo. T. Barnes, of the Crane Iron Company; Professor F. A. Prime, of the Allentown Iron Company; Mr. Janney, of the Glendon Iron Company; and J. G. Fell, of the Allentown rolling-mill furnaces. The committee representing the rolling mills and other iron manufacturers is composed of H. W. Allison, of the Allentown rolling mills; Oliver Williams, of the Catasauqua Mfg. Company, and Mr. Howe, of the Delaware Rolling Mills.

The Taylor revolving bottom gas producer which has been working so successfully for the past year at Chester Furnace, N. J., is attracting much attention, and a number of them are now being built by different iron and steel works. It will probably play an important part also in all fuel and water-gas processes, which is now getting to be such an important problem.

At the meeting of the Namaqua Copper Company, the chairman said: "On January 25 we issued a circular stating we had concluded a contract for three years with the Paris syndicate. That contract is as follows: The period it covers is three years certain, with continuation for a further like period at the option of the French company, the Société des Métaux. The quantity of ore we are to deliver is regulated as follows: The first year, 5500 tons; second year, 7000 tons; third year, 8000 tons. The price is 12/9 per unit of copper, which works out at a profit to our company of about £10 per ton of ore. The capital over which your profits have to be divided is £180,000, and you will, therefore, easily see that large dividends will accrue. Our second period of three years, if availed of by the French company, provides for the sale of an annual average quantity exceeding 9000 tons, when our profits would, of course, increase pro rata."

"Webb's Academy and Home for Shipbuilders" is the name proposed for an institution about to be incorporated under the laws of the State of New York, through the munificence of Wm. H. Webb, whose public spirit and many good deeds have already gained for him the esteem of his fellow citizens. The bill before the Legislature specifies that the object of the institution is "to afford free and gratuitous aid, relief and support to aged, decrepid, invalid, indigent, distressed or unfortunate men who have been engaged n building hulls of ships or vessels or marine engines for such, or any parts of either hulls or engines in any section of the United States"; also to provide competent young men "free and gratuitous education in the art of ship-building and marine-engine building, both theoretical and practical, and support and maintain them while obtaining such education." Mr. Webb has purchased a site for the academy and home, and will erect the structure at his own expense, afterward providing adequate endowment funds. Among the trustees named are Richard Poillon, Henry Stees, Chas. H. Cramp, Wm. H. Webb, Thos. F. Rowland and others equally well known as builders of ships and engines.

"Lamson Store Service" is a queer kind of stock quoted in the financial reports of Boston. The *Herald*, of that city, remarks: "This company ought to get their novel method of raising capital patented. Their share capital is now $5,000,000, or 50,000 shares of the par value of $100. To replenish the treasury stock it is proposed to cut the capitalization down to $4,000,000 and par to $50, the number of shares being thereby increased to 80,000 and the treasury gaining 30,000 shares. When this is exhausted there will be nothing to hinder another reorganization, through the reduction of the capital to $3,000,000 and par to $25, the number of shares being increased to 120,000, of which 40,000 can go into the treasury. Of course, if a $50-par share is worth the same as a $100-par share, as is now claimed, a $25-par share will be worth as much as a $50-par share. Perhaps there may be some fallacy in this reasoning which Lamson shareholders will be able to discover. In any case there is food for reflection in this paragraph."

The citizens of Sioux Falls, Dak., are desirous of promoting the manufacturing interests of that locality, and are giving tangible evidence of that fact. They have offered a bonus of $5000 to a plow factory to be located there and have subscribed for a large part of the stock of the company.

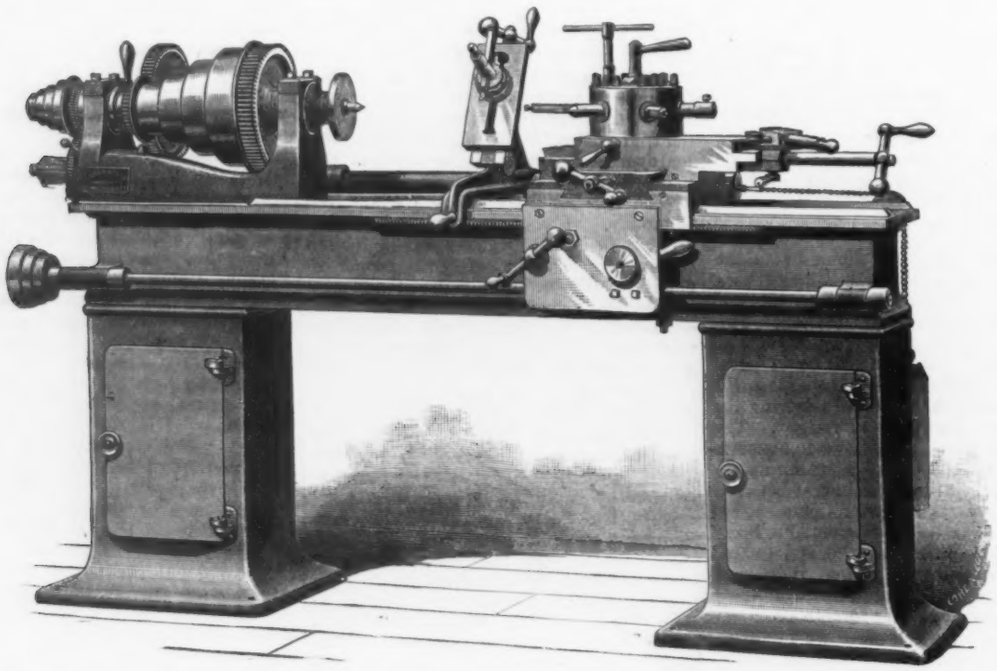
Trials have recently been made on one of the Philadelphia street railways with a steam motor. The results are said to have been satisfactory in the main, but the great weight of the apparatus will necessitate the laying down of heavier rails.

Mr. Joseph D. Weeks, of Pittsburgh, recently elected secretary of the Protective Tariff League, has formally taken control of that organization and will hereafter direct their operations.

New Turret Lathe.

Messrs. Lodge, Davis & Co., of Cincinnati, Ohio, are turning out an improved cabinet turret lathe, illustrated on this page.

In addition to the regular features of brass-working lathes it has a power feed for operating the turret. But the leading departure from older designs is in the application of a taper attachment to this class of tools. It is set between the shears and is adapted for boring any taper with power feed. The attachment can be set with great nicety by an index reading $\frac{1}{64}$ inch to 1 foot. One line on the circular index moved from the starting point would set the tool to bore $\frac{1}{64}$ inch taper to a foot; two lines, $\frac{1}{32}$, &c. This may be done by removing the taper-pin, which holds the turret slide exactly central. This feature is particularly advantageous on taper work where square facing is to be done afterward. In the old methods for taper work the head required to be set over and for facing off it was necessary to replace it. By this improvement the taper end square facing can be done with one chucking.



NEW TURRET LATHE, BUILT BY LODGE, DAVIS & COMPANY, CINCINNATI, OHIO.

The Manufacture of Drop Forgings at Chicago.

The increasing use of machinery for all sorts of purposes, including even household and office apparatus, undreamed of but a few years since, has created a large demand for peculiar shapes of iron and steel. A great many of these shapes might be cast with fairly satisfactory results, but it has been found that wherever strength is desired, combined with cheapness of production, these important requisites are best secured by drop forgings or shaping in dies under hammers. The Chicago Drop Forging and Foundry Company were organized in October, 1886, with a view to making a specialty of fine, light iron and steel forgings of this character. They purchased a tract of four acres of land at Kensington, Ill., a suburb of Chicago, on which stood a brick building, 80 x 200 feet, which had been used for other manufacturing purposes. New machinery was put in, and the first work undertaken was Mark's automatic car coupler. The manufacture of this coupler is still continued, 1000 sets a month now being turned out. A year later the machinery and business of the Cleveland Machine Company, who had been making drop forgings and cutlery for five years, were bought, and the plant was removed to Kensington, a new frame building, 40 feet long by 180 feet, half of it two stories high, being built to accommodate the increase. The operations of the company were necessarily attended with deliberation, while the ground work of their business was in process of formation, but it is now felt that success has been thoroughly achieved, and they do not hesitate to undertake the most difficult shapes. Specimens of the work they have already turned out are almost startling to expert iron and steel makers, in revealing unexpected possibilities in the manipulation of these metals.

A recent visit to the works, at Kensington, was fraught with interest. The brick building above referred to is used for the forging department and machine shop. There are 15 drop hammers and 6 Bradley hammers in the forge plant. Some of these are regularly engaged on parts of car couplers, others on shears and scissors, and the remainder on special orders for carriage hardware, parts of agricultural implements, sewing machine work, &c. Their machinery for making and finishing carriage hardware is very complete. The machine shop is equipped with drills, shapers, planers, milling tools, &c., much of which has been designed and built on the premises. One of the drills will bore four holes at a time. All the dies for the drop forges are made in this machine shop. A 250 horse-power Reynolds-Corliss engine operates the entire machinery, steam for power and heat being furnished by two 16-foot tubular boilers.

Power is conveyed to the cutlery building by means of a cable, 100 feet long from center to center of pulleys, passing above a railroad siding which has been built into the works. The blanks for shears and scissors having been forged into shape from solid steel. They are brought to this department for finishing. Here the holes for the screws are drilled and tapped, after which the blades are tempered, ground, smoothed on emery belts and wheels, screwed together and nickel-plated. Finally they reach the packing room, in which they are buffed, stamped, inspected and arranged in boxes for shipment. With every order a partly forged blade is packed, to show the material from which the shears are made, so that the recipients can see that solid steel is used. The capacity of the works is now 100 dozen pairs daily, embracing a great variety of styles. The company have had so much success in their patent process for forging shears that they are about to make tailors' shears, which have hitherto not been made in this way.

The works are equipped with Brush electric lights throughout. The comfort and convenience of the workmen have been further studied in the construction and arrangement of the buildings. They are roomy and have large windows, giving an abundance of light. The number of employees is now 140. The company is composed of Chicago and Cleveland capitalists. Morris Sellers, manufacturer of the well-known Samson splice-bar, is president; R. H. Lewis, of the Calumet Iron and Steel Company, vice-president; Ira Harris, secretary; Geo. S. Willits treasurer, and W. P. Hatch superintendent. Mr. Hatch has had long experience in the manufacture of cutlery and drop forgings, having been connected with establishments in Connecticut and Ohio. He started the works at Elyria, Ohio, being the pioneer in the cutlery business in the West, afterward removing to Cleveland. The foremen are all picked men-selected for their ability, while the work, men are thoroughly skilled mechanics.

A six-inch Longridge wire gun, built at Aboükoff, Russia, has recently been tried with results so satisfactory to the Russian ordnance authorities that they are now constructing two guns of 8-inch and 12-inch caliber of the same design.

Corrugated fire-boxes, according to the London *Engineer*, have been made and used with the utmost success on the Austrian State railways for some thirty years.

THE WEEK.

The Marine Trades Council is being organized at all the lake ports. The delegates to meet in Chicago will represent the lumber-vessel unloaders, the grain shovelers, the coal heavers, the salt laborers, the iron-ore shovelers and the seaman's Unions, in all comprising about 5500 men.

The proposed Chinese treaty, the text of which has been made public, prohibits absolutely the immigration to this country of Chinese laborers for a period of 20 years, with privilege of renewal, but permits those now living in this country to visit China and return to the United States under certain restrictions. It also makes an exception in favor of Chinese merchants, students, &c., who may visit and reside in this country. Provision is made for indemnity to Chinese sufferers from mob violence in the West.

President Norvin Green of the Western Union Telegraph Company, in addressing the Committee on Interstate Commerce at Washington last week, afforded a partial insight of the affairs of this mammoth corporation. The people had an idea that telegraphs could be built for little or nothing. The Western Union Company, he said, could demonstrte that since the consolidation of telegraphs in 1866 it had expended $55,600,000 in the plant. Thirty millions of this had been in actual money, and some of it had been in stock paid for other property. The company had to give a sum equal to its capital stock foi patents, and that duplicated the stock of the property. Since that date the water had been squeezed out of the stock in divers ways. There is a common impression that this great property was controlled by one man. The actual fact about it was this: The 30 directors of the company held less than $27,000,000 of the stock, leaving nearly $60,000,000 in the hands of sundry parties. The largest holding of any one man was a little over $20,000,000. The voting power outside of the property was larger than the voting power inside of the property. To illustrate the effect of consolidating the old companies Dr. Green had prepared a table showing the cost of the average message to the company and to the public every year from 1868 to 1887, inclusive. In the former year the average expense to the company of handling a message had been $63\frac{4}{10}$ cents. In 1887 it had been reduced to 23 cents. The cost per message to the public had been reduced during the same period from $\$1.04\frac{7}{10}$ cents to $30\frac{4}{10}$ cents. In 1868 the profit to the company on a message had been over 40 cents; in 1887 it got a profit of but $7\frac{4}{10}$ cents

To abate the smoke nuisance has been a special object in Detroit for some months past, and the official inspectors are now inquiring into results, where preventive apparatus has been introduced. "Nearly every firm that has placed a smoke-consumer in use," says Inspector Simpson, "is more than satisfied with the results, both as an economizer and as a nuisance-abater. There's no denying the fact that the consumers now employed are effective destroyers of the smoke evil. We have quite a long list of places that had been complained of before placing the consumers, and are now unobjectionable to people in the neighborhood. James Jenks told us that he had spent $30,000 in trying to get a consumer that would consume and failed."

The future greatness of Australia is pictured in glowing colors by the London *Spectator*. One hundred years hence, we are told, Australia will be a federal republic, peopled by 50,000,000 of English-speaking men, who, sprung from the same races as the Americans of the Union, will have developed a separate and recognizable type, resembling, yet differing from, that of their cousins in the Western Atlantic.

A combination formed in Boston last week includes nearly all the large sash and blind manufacturers in New England, New York, New Jersey and Pennsylvania. The *Bulletin* says it will cover about 75 per cent. of the goods annually turned out in those districts. Prices will be advanced about 10 per cent., but the scheme will not go into effect until after the spring trade. Production will also be regulated. Each establishment pays a certain sum of money into a pool and forfeits if the rules of the combination are broken.

General Master Workman Powderly, of the Knights of Labor, has issued a "special call" to the order, asking that each assembly act upon certain questions looking to the establishment of an educational department for the purpose of instructing the members as to the futility of strikes, &c. This is the first time, it is said, that the General Master Workman has requested advice from the various assemblies in the order.

The Sinking Fund Commissioners on Monday opened 19 sets of plans from different architects for the proposed new municipal buildings on City Hall Park. The cost of executing the plans varies from $3,000,000 to 6,000,000. The commissioners will further consider the matter on Friday.

The revolt of the Brewers' Association against what they characterize as "union dictation" has been followed by a supplementary statement by Wm. A. Miles, president of that organization, in the course of which he says: "At a meeting of representativs brewers from all over the United States, at which the situation of the labor question throughout the country was thoroughly discussed, the testimony was uniform that where the most arrogant demands of trades unions had been unwisely complied with the employers had suffered the most trouble and annoyance from the labor unions, and the opinion was equally unanimous that the time had come when the trade must refuse any longer to make contracts with labor organizations, and insist on their right to deal individually and directly with their men. The circular now published is the culmination of that discussion, and the entire trade is unanimous upon it. This is not a local affair, but is national in the fullest sense of the word, and it is not confined to one branch of the brewing trade, but includes the ale and porter as well as the lager beer brewers in every State of the Union. We do not expect any trouble, but if any men go out on strike hereafter at the dictation of any trade union or organization they will stay out."

Mayor Hewitt last week made an earnest plea before a committee of the Legislature in behalf of his scheme of rapid transit, and in opposition to a scheme devised by the Board of Aldermen. The Mayor's project is for an underground road by tunnel and cuttings from the Grand Central Depot to the Brooklyn Bridge, with provisions for a possible extension above Forty-second street on the west side, the whole to be leased to the New York Central and Hudson River Railroad corporation for 30 years. The Aldermen propose that when the Mayor initiates a movement for city construction of rapid transit the Commissioner of Public Works shall prepare a plan, and the Board of Aldermen shall have the final approval of the scheme. The Mayor, in advocating the bill prepared by him, explained that the supervision, construction and operation of the road would be in the hands of a commission consisting of the Mayor, Comptroller and Commissioner of Public Works. There must be a mutual agreement between the commission and the Board of Aldermen. When the plans were perfected the Board of Aldermen and also the property owners must ratify the decision of the commission. The work must be done by contract. The gain to the city would be by not spending the city's money, but lending it to the contractors. Three per cent. bonds could be issued, and the city would therefore borrow money at that rate on account of its high credit. The money could be loaned to the contractors at 5 per cent., and the city keep 2 per cent. a year. In this way at the end of 35 years the city would own the road, and it would revert to the city."

The owners of the Evelyn flats in this city propose to carry the walls up to the hight of 112 feet.

The New York Park Commissioners have selected a site for the new Museum building.

The new steamship Chester left Philadelphia last week for Rotterdam with a cargo of 1,500,000 gallons of refined petroleum in bulk. This is, perhaps, the largest cargo of petroleum that has ever been shipped from any port in the world. Although the Chester sails under the English flag she is owned by New York capitalists. She is 320 feet long, 38 feet beam and $21\frac{1}{2}$ feet depth of hold, and is divided up into compartments, with gauges to allow for contraction and expansion of the fluid while at sea. The following tank steamships will run to that port during the coming summer: Glueckauf, 950,000 gallons; Vorwaerts, 950,000 gallons; Minister Maybach, 1,000,000 gallons; Willkommen, 1,400,000 gallons; Hans and Kurz, 900,000 gallons; Ocean, 1,110,000 gallons; Hafis, 680,000 gallons, and the Chester, 1,500,000 gallons.

The Government spends annually $300,000 for mail bags, which cost from $5.84 to $7 each. One of the repair shops is located in Washington. Not long ago a requisition came to Postmaster-General Dickinson for 7000 mail-bags. Mr. Dickinson held the order until he could investigate it. As a result of the inquiry a very peculiar state of affairs was found to exist. A visit to the shops disclosed the fact that the cellar was piled to the ceiling with bags, many of them entirely new, while others were so slightly damaged that it was evident they had made but a trip or two. It is estimated that there were found at least 10,000 bags in the cellar, worth certainly not less than $60,000.

The Land Office finds frauds in redwood timber lands, in Humboldt County, Cal., amounting to $2,000,000.

But few changes are contemplated in the terms of the Interstate Commerce law. The most important proposed by the Sewell committee is that the decisions of Commission shall be final, whenever both parties to a controversy agree to abide by such decision, without appeal to the courts.

Governor Green, of New Jersey, signed the bill allowing the Morris Canal Company to surrender their charter. He said if the land does not belong to the canal company it can be recovered by the rightful owners by applying to the courts.

In a hearing before Judge Barnard, at Poughkeepsie, on an application for more land in that city for the New York and Massachusetts Railroad, Henry D. Cone, who owns the road, testified that he has formed a combination with the Poughkeepsie and Delaware Valley road, the Ontario and Western and the Lehigh and Hudson to make an all-rail route for coal and freight and passengers from the West and Southwest into New England. Freight

traffic to the amount of 750,000 tons would pass over the new route and down the Hudson River to New York City.

The population of the Pacific Coast was made the subject of special inquiry by the San Francisco *Commercial Herald* with the following result:

California	1,250,000
Oregon	270,000
Washington	150,000
Nevada	75,000
Utah	200,000
Idaho	100,000
Montana	130,000
Arizona	90,000
Colorado	250,000
New Mexico	150,000
Total	2,665,000

The figures here given are arrived at in the case of California from the census of school children of 1887, with the allowance made for immigration and natural increase since. That gave a population of 1,170,298.

On April 10 four-car trains will be put in operation on the Brooklyn Bridge. There will be 40 trains an hour, with an estimated capacity of 19,000 passengers.

The effects of introducing machinery on the great sugar estates in Cuba are spoken of by a correspondent, who says that on all the great plantations tremendous engines and machinery are now in operation, and on many, like that of El Bilboa, where, by the Deronse system, the complete manufacture of all grades of sugar from the raw cane is effected, the plant has cost $250,000, the annual outlay being also fully that sum for labor and other expenses. Great ado is made in the States where "farmer kings," as in Dakota, use 100 reapers in the harvest field and muster 500 hands. Here 1500 to 2000 hands are required in the labor upon the large sugar plantations.

New York merchants charge serious dereliction of duty upon the managers of the New York Central Railroad in sidetracking merchandise in transit between this city and such points as Little Falls, Amsterdam, Schenectady, Hudson, Troy and Cohoes, in order to give dispatch to through freight, thus discriminating in favor of the West and entailing heavy losses on shippers who are the least favored.

The Great Eastern is no longer in commission, the City of Paris is still on the stocks, and for the time being the City of New York, of the Inman Line, lays claim to being the biggest vessel afloat. Her length over all is 560 feet; breadth, 63½ feet; depth molded, 42 feet; giving a tonnage of 10,500 tons. She is built of 30,000 separate pieces of steel, weighing in all 7000 tons. Each square inch of steel is guaranteed to stand a strain of 30 tons, and it would require a strain of 60,000 tons to tear the ship apart. She has two bottoms, one several feet inside the other, and both equally strong. The Inman people make no secret that they have built these two vessels to distance the greyhounds of the Cunard Line—the Etruria and the Umbria—and fleetwings of the North German Lloyd—the Lahn and the Aller.

How the arbitration of labor difficulties works in practice is indicated by the annual report of the State board in Massachusetts. Of the 24 cases noted seven concern Lynn shoe manufacturers. From time to time organized labor has menaced capital until in many instances manufacturers withdrew in self-defense to quieter retreats. The result is that while help are paid comparatively better wages in Lynn than in other shoe towns, yet the amount of work is gradually decreasing, the city is not doing more than two-thirds of its capacity, and there is a surplus of labor. The most important case that came before the board was that of F. W. Breed. When asked his opinion as to the adjustment of the wage question by arbitration he replied: "The question is too deep for any board to settle. They do the best they can. In the shoe business there is now machinery and men enough to do the year's business in six to eight months' time. There are about as many manufacturers west of the Hudson as east of it, all desirous of the business and all fighting for it. There is no export trade and the shoe business is about the highest paid for workmen of any business; therefore no workman desires to go out of it, but of course wants the same large pay and steady work. Of course this is impossible, and then come friction, dissatisfaction and strikes. The Board of Arbitration recognize the true state of affairs and do their best, but the workmen apparently will hear to no decision not immediately to their apparent present interest, as witness the declination of the State board's advice to the hand sewers. New England is not now making as great an advance as she should. This is wholly on account of wages being higher for shoe labor in New England than elsewhere in the country, as statistics show. This is partly balanced by excellent facilities for manufacturing and by lack of profit on the part of the manufacturers, which is now so low that co-operation is not practical in any large way, thus showing that wages are now too high for the rest of the country and must drop."

The Governor of Mississippi has called a convention to be held at Jackson, May 24th, for the encouragement of immigration from the Northern States.

The enormous equipment demanded by a first-class railroad these days appears from a few figures relating to the Philadelphia and Reading. On December 1, 1887, the rolling stock and motive power equipment of the company consisted of the following: Total number of locomotives, 604, of which 150 were passenger engines and 362 freight and coal engines; total number of cars, 26,458, of which 7444 were four-wheeled, 18,997 eight-wheeled, 16 twelve-wheeled and 1 sixteen-wheeled. The above figures include 17,985 coal cars, 7001 freight cars, 571 passenger cars, besides over 1000 additional cars of various kinds used in the maintenance of roadway and other departments of the company's service. The Reading Company now own 11 steam colliers, 5 steam tugs, 2 schooners, 58 barges and 4 car floats used between Philadelphia and Camden. There are also in use on the Schuylkill Canal 310 barges, 2 steam tugs and 1 packet-boat. On November 30 there were, in addition to the above enumerated rolling stock, out of service to be replaced, 17 locomotives, 396 eight-wheeled cars and 403 four-wheeled cars, and there were besides 1442 four-wheeled iron coal cars out of service to be replaced by other kinds of cars. The Car Trust rolling stock built prior to December 1 last, included in the above, numbers 100 locomotives, 3492 coal cars, 1697 freight cars and 67 passenger and baggage cars.

The key-plates of the great steel river arch of the new Harlem Bridge, at 181st street, have been swung into position, and it is believed that if work goes on at the present rate the bridge will be thrown open to the public in December next. When these plates are set and riveted, and all the false work underneath the arch removed, the graceful outlines of the structure will stand revealed. It has been claimed that the new bridge will suffer in comparison with High Bridge, which crosses the Harlem just below the new structure, but the architects claim that the contrary is the fact. There are two steel arches, each 510 feet long, and the length of the bridge is 2373 feet. The roadway will be 50 feet wide, and the sidewalks 15 feet each, making the entire bridge 80 feet wide. The total cost when finished will be $2,600,000. The engineering corps consists of Chief Engineer William R. Hutton, William J. McAlpine and Theodore Cooper, consulting engineers, and John Bogart, resident engineer. The contractors were the Passaic Rolling Mills Company and Myles Tierney. The former company were to furnish the iron superstructure and erect it, and the foundations and masonry were to be built by Tierney. In September, 1887, the Passaic Rolling Mill began the erection of the ironwork. This was an undertaking of much difficulty. Great structures of false work were erected, and immense pieces of steel had to be hoisted to great hights. A single segment in each arch weighs over ten tons. As the ironwork progressed, the masonry work was ready, and there was little delay. When finished, the arch above the river will be 133½ feet above high water, while the roadway will be 151 feet. This is said to be a trifle higher than the Brooklyn Bridge. Each arch will have a rise and fall at the center of 6 inches. This is governed by a patent key. The approaches are to be finished with the best stone, and the ornamental work as promised by the plans. Bronze railings and lamps will tend to add to the general effect.

The Senate passed the House bill providing for an "arbitration conference to promote commercial relations between this country and Mexico, Central and South America and Brazil;" and the bill has gone to a Conference Committee. There are few, however, who have much confidence in its efficacy to remove existing impediments.

The Sub-Committee of the House Shipping Committee, which has heard the arguments of representatives of the Shipping League and others on the pending bill to grant shipping bounties, made an adverse report.

A committee is about to canvass Baltimore for subscriptions to the amount of $500,000 for an exposition building in that city. About $100,000 has been obtained. The new buildings erected in Cincinnati for the Centennial Exposition were turned over to the commissioners on Saturday. The exposition will be opened July 4th. The Exposition Society of Pittsburgh are pushing the work on their new building.

William Walter Phelps's mansion at Teaneck, New Jersey, caught fire on Sunday night from defective gas apparatus, and was wholly destroyed. Loss estimated at near $500,000.

Two successive explosions occurred last week in a coal mine near Rich Hill, Mo. The mine was wrecked, and of over 100 men who were in it at the time 24 were asphyxiated.

The several commercial bodies in Montreal unite in calling upon the Government for relief from the heavy tolls levied upon commerce at that port. It was alleged by the chairman of a meeting held last week that the trade of the port of Montreal had remained almost stationary. Tolls four or five times greater than in New York had to be levied, and in consequence Montreal's share of the grain and flour shipping trade for the Continent had decreased from 28 per cent. in 1872 to 12 per cent. in 1887. Resolutions were adopted setting forth that the Government should take such measures as would enable the Harbor Commissioners not only to reduce the dues, but also to provide increased accommodation and improved facilities for traffic.

MANUFACTURING.

Iron and Steel.

Under date of March 26 the Girard Iron Company, of Girard, Ohio, write us as follows: "We banked our furnace on last Saturday and are now idle; the unsatisfactory condition of the market and the price obtainable for our product being much less than it costs to make it, we were compelled to close down or run at a loss. We do not now complain at the price of coke, but the freight from Connellsville to the Shenango and Mahoning valleys is too much, and the recent reduction of 8 cents per ton is no help now, but a gross insult to the furnacemen. Labor must also contribute its share. We will not resume work until we get some substantial reduction all along the line or until the market improves."

The La Grange Furnace, La Grange Furnace Company, Stribling, Tenn., has been compelled to bank, owing to inability to obtain charcoal.

Under date of the 26th ult. the Indianapolis Rolling Mill Company, of Indianapolis, Ind., write us as follows: "We stopped manufacturing a week ago for an indefinite period, and have not yet determined what we will do. Natural gas will be at our door in about 60 days. We hope to be able and ready to start again by that time, either on steel shapes or rods, or both."

The Muirkirk Furnace, of Muirkirk, Md., will probably blow in some time this month.

We are informed that there is little prospect of the plant of the Columbus Steel Company, of Columbus, Ohio, which was recently seized by the sheriff, resuming operations. It is probable that the plant will be wrecked and sold for the benefit of the creditors.

The Eagle Furnace (charcoal), of Roland, Pa., is idle for want of stock.

The report that the works of the Cumberland Iron and Nail Company, of Bridgeton, N. J., had closed down for an indefinite period is officially denied. The works have been running for the past two months on half-time and recently commenced running full time in all departments.

The Franklin furnace, Franklin Iron Works Post Office, N. Y., blew out on the 1st inst. for repairs.

The Pottsville Iron and Steel Company, of Pottsville, Pa., have ordered drawings from Smith & Laughlin, metallurgical engineers, of Pittsburgh, Pa., for a double regenerative gas furnace, to be used for heating extra large sizes of channel bar and I beams.

The Etna Tube Works of Spang, Chalfant & Co., at Etna, Pa., were closed down indefinitely last week, on account of a strike among the employees. About 350 men were thrown out of work.

The Crozer Iron and Steel Company, of Roanoke, Va., are relining their furnace, which has been idle during the past month.

The furnace of the Etna Iron Works, Limited, New Castle, blew out on the 20th ult.

After a suspension of several weeks, the Spaulding Iron Works, at Brilliant, Ohio, resumed work on Tuesday of last week. The factory and plate mill are on full. The differences that caused the suspension have been adjusted, and everything is running satisfactorily.

The workmen at the Millvale Iron Works of Graff, Bennett & Co., of Pittsburgh, numbering between 600 and 700, who had two or three days' wages due them when the firm made an assignment, were paid off last week. The schedule of liabilities and assets of the firm has not yet been given to the public, but is expected to be given out during the present week.

The Warren furnace, located at Hackettstown, N. J., has lately been purchased by Mr. John B. Jones, of Nevada.

The contract for 370 tons of steel and angle iron, for use on the south wing of the Western Penitentiary now in course of erection in Allegheny City, has been awarded to Jones & Laughlins, of the American Iron Works, Pittsburgh, for $16,000. The above-named firm are laying the foundation for the erection of a 26-inch mill for the purpose of rolling billets and blooms for making steel beams and channel irons.

No. 3 furnace of the Pennsylvania Steel Company, Steelton, Pa., was blown in on March 13, No. 4 was in blast during whole of month, while three furnaces are idle.

Thomas Furnace, of the Thomas Furnace Company, at Niles, Ohio, was blown out on Monday, the 26th ult., for the purpose of making extensive repairs, and will not resume operations for about three months. The company have a large stock of pig iron on hand.

The Russia mill of the Falcon Iron and Nail Company, at Niles, Ohio, has been closed down temporarily, owing to dull trade and close prices on sheet iron. The company advise us that they do not think the stoppage will be longer than two or three weeks.

One of the stacks of the Missouri Furnace Company, of St. Louis, Mo., was blown in on the 2d inst., after an idleness of nearly three months.

Furnace No. 2, of the Sharon Iron Company, at Sharon, Pa., will be blown out in a short time for the purpose of being repaired.

The buildings of the Leechburg Foundry and Machine Company, at Leechburg, Pa., was destroyed by fire on the afternoon of the 30th ult. The fire was caused by workmen who were extending the gas-pipe. The loss was about $40,000, with an insurance of $17,000. The company will rebuild the works at once.

The Ivanhoe Furnace, Ivanhoe Furnace Post Office, Va., is undergoing extensive alterations and will be changed to coke. When completed the furnace will be 60 x 12 feet, with a hearth 6 feet 2 inches x 16 x 20 feet, equipped with Whitwell stoves. It will be blown in about September.

George Stage, of Greenville, Pa., has leased the Greenville Rolling Mill of P. L. Kimberly & Co., at that place, for a period of three months, and operations were resumed at the plant on Monday, the 2d inst.

Parties connected with the Hartman Steel Company, Beaver Falls, Pa., are about to take up the manufacture of patent enameled signs.

The first cast of Mitis metal was made at the works of the Eureka Cast Steel Company, Chester, Pa., on the 27th ult.

A meeting of the furnace employees of the Mahoning Valley, Ohio, was held in Youngstown on Tuesday, the 27th ult., to consider the notice of a reduction of 10 per cent. in their wages which had been demanded by the operators, mention of which was made in these columns some time since. Although it was expected met the reduction would be refused by the than, after careful consideration it was resolved to accept it and return to work. The men employed at the furnaces of the Brier Hill Iron and Coal Company who went out on a strike also agreed to accept the reduction, and the furnaces, which were banked down for a few days, have resumed operations.

One of the four new Ensley furnaces, of the Tennessee Coal and Iron Company, at Birmingham, Ala., is to be blown in at an early date.

F. N. Hoffstot & Co., pig iron brokers at Pittsburgh, have entered suit against Graff, Bennett & Co., of that city, to recover $26,699 on promissory notes.

Topton Furnace, at Topton, Pa., will blow in on the 8th or 10th inst.

Messrs. Andrews & Hitchcock, of Youngstown, Ohio, write us: "We have one furnace in blast making blackband foundry iron. We stopped one furnace last November when the Bessemer business dropped off. We think the foundries are doing a fair business, as we are disposing of our iron as fast as made. We have no stock of iron on hand. We are selling good, well-graded No. 1 Hubbard Scotch for $18, cash, f.o.b.; mill iron is selling for $15, f.o.b., for well-known brands; cinder mix iron is selling for less whatever they can get. There is about 90,000 tons of iron on the furnace banks in Mahoning and Shenango valleys and the owners of it are using every possible means to reduce these stocks and keep their furnaces running, and are offering the iron below cost. They reason that when new ores come down from Lake Superior and coke at $1 per ton on cars, pig iron will be made very cheaply. Labor has already been reduced in this valley 10 per cent. There will also be a very large falling off in the demand for Bessemer pig iron this year. The President's message stopped all buying except for actual need; with all the 'black eyes' the furnacemen have got, they are in better shape than the rolling mill men."

The new Floodwood furnaces of the Ohio and Western Coal and Iron Company, of Columbus, Ohio, are rapidly nearing completion, and will shortly be put in blast.

After an idleness of three months, one of the Maryland furnaces, H. W. Ellicott & Sons, Baltimore, Md., has lately blown in.

Heretofore the range of applicability of galvanizing wire cloth has been limited, eight meshes to the inch being about the finest grade capable of being done satisfactorily, because the meshes filled up with the coating metal. Mr. Benjamin Scarles, Sr., of Clinton, Mass., has, during the past ten years, been carrying on a continued series of experiments, with the object of overcoming the drawbacks incident to galvanizing, the result of which has been a process yielding the well-known silver finish. As ordinarily carried out, galvanizing has the tendency to impair the ductility and tenacity of the wire and produce what is termed "rottenness." This Mr. Scarles has overcome, and he has succeeded lately in galvanizing the finest wire, samples of which have been submitted to us, and which appear fully to bear out his claims. Another very interesting product is wire cloth, as fine as 50 meshes to the inch, coated perfectly without filling the meshes. Mr. Scarles is now putting down a plant on a large scale for the Clinton Wire Cloth Company for producing galvanized fine wire and fine-mesh wire cloth.

The Union Furnace, of Winfield, Pa., which has been thoroughly repaired during its five months' idleness, will be blown in during May.

A prominent blast furnace manager in the Schuylkill Valley reports that many of the Anthracite furnaces now in blast are cleaning up stock, and preparing to

blow out unless a considerable reduction can be obtained in cost of materials and freight. He urges that at present prices the Eastern Anthracite furnaces cannot stand the competition.

Wm. Swindell & Bros., engineers and contractors, at Pittsburgh, have contracted with the Detroit Copper and Brass Rolling Mill Company, Detroit, Mich., for one 16-hole copper and brass regencrative gas melting furnace. They have also just completed for this firm eight of their improved producers and eight large gas-heating furnaces of their most improved type, for heating sheet copper and brass. This is claimed to be the first case where copper and brass have been heated by manufactured gas successfully. This firm have also received contract for four Swindell steel heating furnaces to be run with oil at works of the Detroit Steel and Spring Company, Detroit, Mich. They have also recently contracted with the Standard Mfg. Company, of Allegheny City, for one large enameling open-hearth furnace. Also with Oliver Bros. & Phillips, of Pittsburgh, for one of their improved regenerative natural gas heating furnaces. This is the fourth furnace of this tppe they have built for this firm since last July. Also one of their improved natural gas heating furnaces, bed 10 x 16 inches, and one large annealing furnace for annealing steel plates for the Spang Steel and Iron Company, of Pittsburgh. They have just finished one large natural gas heating furnace and one large annealing furnace for railroad axles for the Pittsburgh Forge and Iron Company, also of Pittsburgh.

Machinery.

Wm. Tod & Co., of Youngstown, Ohio, have contracted to build two Porter-Hamilton engines for the Kokoma Wood Pulp Company, of Kokoma, Ind.

The Page Belting Company have lately received a large order from Japan for a lot of their Hercules raw hide belting. Within a week they have received inquiries for prices on their goods from St. Petersburg, Russia, and Alexandria, Egypt.

Messrs. Morse, Williams & Co., of the Morse Elevator Works, Philadelphia, Pa., have issued a notice to the effect that they have moved their office from 411 Cherry street to their new building, 1105 Frankford avenue, adjoining their works at Frankford avenue, Wildey and Shackamaxon streets.

The National Pipe Bending Company, New Haven, Conn., have recently shipped the following feed-water heaters: One 500 horse-power to the Union Metallic Cartridge Company, Bridgeport, Conn.; one 300 horse-power to the Bridgeport Rolling Mill, Bridgeport, Conn.; one 400 horse-power to the Meriden Brewing Company, Meriden, Conn.; one 300 horse-power to the Schuyler Electric Light Company, Elizabeth, N. J.; and one 200 horse-power to the Thompson-Houston Electric Company, Hoboken, N. J. Among those under way are one 500 horse-power for the Consolidated Electric Light Company, Portland, Me., and one 100 horse-power for San Francisco; also an iron coil of 1½-inch pipe containing 300 feet, the outside diameter of the coil being 15 feet, and 49 smaller coils of 2-inch pipe.

The following recent orders have been reported by Messrs. Riehlé Bros., of the Philadelphia Scale and Testing Machine Works, Philadelphia, Pa.: One of their latest improved cement-testing machines, 2000 pounds capacity, for the West Point Military Academy; standard cement-testing machines, 10,000 pounds capacity, for the following: F. Firmstone, Easton, Pa.; Vanderbilt University, Nashville, Tenn., and the city engineer, Buffalo, N. Y.; one 50,000-pound testing machine, Vanderbilt pattern, to the Farrell Foundry & Machine Company, Ansonia, Conn., and a 50,000 pound spring-testing machine to the Atkinson Car Spring Company, of Chicago, Ill.; one of their latest improved 100,000-pound, screw-power, Harvard testing machines for the Baltimore and Ohio Railroad Company, and a 5000-pound transverse testing machine for the Decatur Car Wheel Company, Decatur, Ala.; One cloth-testing machine to Wm. Ayers & Sons, Philadelphia, and twine-testing machines to the Schlichter Jute Company, of Philadelphia, and the Wilmington Mills Mfg. Company, Wilmington, Del.

Geo. J. Fritz, of the Central Iron Works, St. Louis, Mo., announces the following recent shipments: One Fritz patent eccentric doctor to Waco Roller Mill, Waco, Tex.; one Fritz patent eccentric doctor to Hartford City, Ind.; one 24-inch cork extractor to Hoppe & Son Malting Company, St. Louis; one Fritz patent engine to Paragould, Ark.; one Fritz patent engine to Montgomery, Ala.; one 15 horse-power Fritz patent engine to St. Louis; one engine and boiler to Fayette, Mo.; a lot of shafting, pulleys, hangers, &c., to Paragould, Ark.; a lot of grease cups to Carrollton, Mo.; one large steam pump to Mexico, Mo., and one new pump to Cape Girardeau, Mo. In addition Mr. Fritz executed work of a miscellaneous character, such as the grinding of rolls, &c. A large crane hoist was also furnished to the Missouri Car and Foundry Co., of St. Louis, Mo.

Messrs. Lodge, Davis & Co., of Cincinnati, Ohio, report the demand for their iron and brass working tools such as to compel them to run nights in order to fill orders promptly. They have in contemplation the purchase of an additional piece of ground situated between their present works and warehouse, the negotiations for which are now going forward. When these are completed they will immediately commence the erection of buildings for additional shop room, measuring 60 x 100 feet.

The Babcock & Wilcox Company, of New York, send us the following under date of March 28: The United States Circuit Court for the district of New York, Judge Wheeler, has given a decision in favor of the Babcock & Wilcox Company, against the Pioneer Iron Works, for infringement of their patent, in building the Zell boilers, and the latter company have paid $6500, in settlement for such infringement. A similar suit against the makers of the Moore boiler is now pending in the United States Circuit Court for the district of New Jersey.

Hardware.

L. & I. J. White, Buffalo, N. Y., have been enlarging their works and putting in new machinery for several months past. The work is now nearly completed, and when it is finished they will have nearly double their present capacity. This enlargement has not interfered with filling their orders, as the new machinery added will be run over extra lines of shafting. They have a new catalogue in the printers' hands, which will, it is expected, be issued about the 1st of May.

Thomas C. Fisher, Anderson. Ind., manufacturer of grain cradles and scythe snaths, is intending soon to rebuild his factory, probably at Anderson, when he will give his entire attention to this line of goods, closing out his stock of stoves, tinware and hardware.

The Old Dominion Iron and Nail Works, Richmond, Va., have their new horseshoe factory in operation, turning out the Walker forged horse and mule shoes of high quality. The factory until recently was located in Baltimore, but has been purchased and removed to Richmond.

Miscellaneous.

The Cat's Run Coke and Iron Company, composed of Fayette and Westmoreland County capitalists, has been formed at Connellsville, Pa., and will build 100 ovens, to be immediately followed by 300 more in the summer. The officers of the company are James Jackson, president; M. L. Hays, secretary and treasurer; A. B. Leidworth, general manager. The seven directors are James Jackson, M. L. Hays, A. B. Leidworth, Charles Bail, John Hensel and Robert Sweeny.

The Akron Rubber Company have been organized at Akron, Ohio, with a capital stock of $300,000 for the manufacture of hard rubber.

There has been organized at Clarksburg, W. Va., for the purpose of mining coal and manufacturing coke, the Farland Coal and Coke Company, with a capital stock of $1,000,000. The incorporators are Joseph Farland, of Clarksburg; Thomas W. Johnson, Wm. H. Stephenson and A. M. Blundon, of Baltimore, and William C. Page, of New York. The principal office will be at Clarksburg.

The H. W Johns Mfg. Company have removed their Chicago branch from 175 to 240 and 242 Randolph street. They occupy in this building the first floor, fifth floor and basement. Their new quarters give them three times the capacity they formerly occupied. They have a steam elevator and steam heat. J. W. Shute, manager of the Chicago branch, has fitted up a very handsome office in the front of the store, back of which are the counting-rooms, while the remainder of the first floor is occupied with the company's stock, such as mixed paints, roofing material and asbestos products. The company have recently added to their line vulcanized asbestos goods for electrical purposes, steam packing, &c.

The Osgood Bradley Car Mfg. Company, of Worcester, Mass., have received a large order from the Boston and Albany Railroad for the building of a new pattern gondola coal car of the following measurements: Weight, 22,510 pounds; capacity, 60,000; outside gauge, 5 feet 4 inches; length, 35 feet.

Licenses of incorporation have recently been granted to the following companies: The Norwich Cutlery Company, Chicago; capital, $50,000; incorporators, Isaac E. Adams, W. A. Hamilton and Lawrence P. Conover. The Ruttan Warming and Ventilating Company, Chicago; capital, $20,000; incorporators, Sterling L. Bailey, J. L. Bailey and Fred. M. Bailey The Globe Light and Heat Company, of Chicago; capital, $500,000; incorporators, W. P. Butler, B. A. May and F. J. Schauer. The Henry Leigh Arms Company, of Chicago; capital, $50,000; to manufacture firearms; incorporators, Isaac E. Adams, F. A. Fletcher and W. A. Hamilton. The Illinois Cycle Company, at Chicago; capital, $10,000; incorporators, F. V. Newell, C. B. Gibson and A. W. Townsley, Jr.

The Cleveland and Canton management have ordered of the Brooks Locomotive Works, at Dunkirk, eight 50-ton Mogul standard gauge engines, to cost $9475 each; seven passenger engines, to cost $8875 each, and three switching engines, to cost $8275 each, to be delivered July 15 or earlier. The 600 25-ton coal cars, lately ordered at Minerva, Ohio, are to cost $370 each and be delivered, 250 June 15 and 50 per week thereafter.

Messrs. North Bros. Mfg. Company, Twenty-third and Race streets, Philadelphia, well known as manufacturers of gray iron castings, have increased their facilities with the special object of producing brass castings, orders for which they are now in a position to fill.

The Iron Age

New York, Thursday, April 5, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

For nearly 20 years the name of Mr. J. C. Bayles has appeared at the head of these columns as Editor. Beginning in the day of small things, he has had the satisfaction of seeing this journal grow and prosper until it stands to-day in influence and reputation second to no trade journal in the world. To this growth and progress his literary skill, strong personality and genial manners have greatly contributed, while they have made him personally widely known and universally popular. A year ago he was appointed President of the Health Department of New York, in which he has made a thorough reorganization in the interest of efficiency and business-like management, gaining the confidence not only of his associates in office, but of the public in a very unusual degree. The cares of this position, and the increasing demands of his own interests in other directions, now render it necessary for him to sever the relations which have connected him with our readers for so many years. To his other fields of activity he will carry the affectionate regard of all who have been associated with him, and their hearty wishes for his future success and happiness. His successor, Mr. Chas. Kirchhoff, Jr., is an accomplished gentleman, thoroughly educated in the best schools of this country and Europe, and with a large experience in technical journalism, the greater part of which has been acquired in this office. For a long time he has been Associate Editor, and of late has had entire charge of the editorial department of *The Iron Age*, so that his qualifications are not matter for either experiment or doubt. Under him *The Iron Age* will continue, as it has always been in the past, honest, fearless and impartial—a journal that can always be relied on for facts, and whose opinions cannot be influenced by any consideration or interest.

DAVID WILLIAMS.

Do Strikes Pay?

Intelligent leaders of labor organizations have at last plucked up courage, after recent great defeats, to squarely raise the issue, Do strikes pay? A review of the history of labor troubles during the past two years shows a long record of extravagant demands, at first weakly conceded, until, flushed with temporary success, the minor labor officials committed a series of fatal errors. Victorious over individuals and small groups of employers, they silenced the voice of the more reasonable class of men and cowed the ostensible chiefs of their organizations. They were coddled by politicians and by a great part of the press, who recognized the advent of a new power. Their professions of good faith and their lofty declarations of principles enlisted the approval and sympathy of all earnest men who acknowledged the necessity of an early amelioration in the condition of the workingmen. But one by one the illusions of those were dispelled who had hoped to lead to, or to witness, the establishment of more mutually satisfactory relations between employer and employee. A calm insistance upon real or imaginary rights developed into imperative demands for concessions out of all reason. Every petty walking delegate or district officer became a senseless tyrant, listening to no law but his own unbridled will. Strikes multiplied in an unprecedented manner, the boycott was resorted to until its most ardent devotee could not hope to keep track of its mandates. There were curious instances of a conflict of authority between the leaders of rival factions of laborers, and the demands for the support of rash strikes grew more and more numerous and exacting. The industries of entire sections were paralyzed or driven away to more peaceful sections, and in a number of great contests an utter disregard was shown for the rights of the public, while scenes of violence were not infrequent.

Slow to abandon earlier hopes and to modify its first favorable impressions, the public has finally been thoroughly aroused. One by one the more fearless public men have denounced the course taken by the class of minor leaders who have come into power during the past few years. Bombastic speeches have lost much of their persuasive powers over the members of labor organizations. Their grip over their former constituency has decidedly weakened. The general public has ceased to regard the announcement of a strike as *prima facie* evidence that the employers are in the wrong. The directors of great corporations have had their hands strengthened by the tacit support of their stockholders and by the sympathy of the people and the press. On the other hand, every great strike of national importance during the past two years has ended in the defeat of organized labor, confessedly in most instances because the contest was entered into by the men with a weak cause, and because the management of the fight was poorly conducted. Even the most conservative and powerful body of this character—the Brotherhood of Locomotive Engineers—has been thoroughly discredited lately. Mr. Powderly has recently taken an unusual step by appealing directly to the members of the Knights of Labor, with a view to obtaining the verdict of that body on the question of diverting the policy of the order more in the direction of supporting educational measures rather than supplying funds for carrying on contests with employers. As fighting machines the unions have proved expensive failures. It remains to be seen whether loftier aims can command enough attention to keep the ranks filled. It is probable that for some time to come our country will continue its industrial progress with less frequent interruptions from wanton strikes or lockouts. Employers, while the end has proven the justice of the position which they have on the whole taken, have felt keenly what power for mischief the ascendancy of the worst element among the men has. When once assured that ignorant outsiders do not aspire to take their business out of their hands to run it in their own way, they will be more willing to make reasonable concessions. The signs are multiplying that that spirit is spreading. There is some promise, therefore, of peace for some time to come. It is to be hoped that a crushing defeat of the strike in the West will be the beginning of a new era.

False Billing of Freight.

Mr. Albert Fink, whose vigorous communications always command respect, has written a lengthy letter to Mr. Cullom, Chairman of the Interstate Commerce Committee, on a subject which manufacturers and merchants are deeply interested in. Mr. Fink has undertaken to suggest some means of correcting an abuse the widespread existence of which every shipper is well aware of. The practice of false billing of freight has been prevalent for a long time. It has usually assumed two distinct forms, that of understating the weight and of representing one class of goods as being a shipment of a different article, the classification of which allows of cheaper feights. The familiar example of shipping cutlery as bolts and nuts may be cited. While there can be no doubt that dishonest shippers have resorted to false billing simply for the sake of cheating the railroads out of freight money, the practice has lost much of its iniquity through the connivance or direct instigation of the railroads themselves. In their eagerness to secure traffic in spite of agreements with other roads, they have entered into an understanding direct or implied with shippers. Considerable pressure has been put upon manufacturers and merchants to assent to this practice by customers who have threatened to turn over their business to more complaisant men. The result has been that neither the merchants themselves nor the railroads when earnestly endeavoring to do so have succeeded in correcting the abuse. It is stated even that it has grown since the passage of the Interstate Commerce law, since it was the only means left of continuing discrimination in favor of a few shippers. The figures printed by Mr. Fink in support of that statement corroborate it. The number of corrections made by the freight inspection bureau on consignments wrongly described by shippers and delivered to the trunk lines for shipment in this city show the following astonishing totals for the last five years:

Number of corrections,	1883	47,573
" "	1884	69,461
" "	1885	69,571
" "	1886	73,091
" "	1887	75,648
Total in five years		335,344

Since in the aggregate these roads handled only 1,200,000 tons of freight per year out of a total estimated tonnage of 480,000,000 for the whole of the United States, the aggregate for the whole country must be appalling. Justice to the honest merchant and carrier demands that some steps be taken to reduce it to a minimum, especially since it threatens to undo much of the good which the Interstate Commerce law aims to accomplish.

The railroad companies are making strong efforts to protect themselves. Freight inspection is being organized, quite an elaborate system having been lately put into operation by the Central Traffic Association. But it is obvious that some power must exist to enforce some

punishment. As it is now, detection merely means a correction of the bill, so that the temptation remains to run the risk, even if a few only of many shipments falsely billed pass through safely. The railroads ask protection as much against unfair competition as against cheating by shippers. They urge that Congress pass a law making intentional misrepresentation of the weight and character of shipments illegal and punishable by fine, hoping that such legal condemnation would deter many from continuing it, and would stop encouragement of and connivance at such practices by railroad companies. With ample safeguards against chicanery and protection to innocent offenders, such a law would do a good deal of good if the railroads undertake to see that it is enforced.

A New Era for St. Domingo.

Now that American railroad men have begun vigorously taking in hand the Dominican Republic, that country is evidently on the eve of material, and we trust moral, regeneration, after having been, next to Hayti, most backward among the larger Antilles. For the past 20 years there have been revolutions or attempts at revolution at short intervals—so much so that the unsettled political condition had nearly become chronic and well-nigh hopeless. In spite of this the exuberant soil of the Spanish portion of the Great Antilles, less mountainous and thickly wooded than the French portion, Hayti, and inhabited by white people, commenced to attract *bona fide* settlers from Cuba, Jamaica, Porto Rico, and even the United States. This gradually brought a fresh element into the country, the movement setting in some ten or twelve years since, and continuing on a moderate scale till its good effects are now being felt. Americans have busied themselves about sugar planting, introducing the very best modern machinery and processes, and, although prices have been low most of the time, it seems to be a paying industry, as the cane thrives better in St. Domingo than elsewhere, is taller, thicker and richer in saccharine contents than even in Cuba and the Sandwich Islands. The demand for Dominican tobacco for Germany has steadily absorbed all the country can produce on its extended, magnificent plateau, the quality being nearly as good as Colombian, the leaf large, of fine color and good texture, while being elastic. The fact is that nearly all Dominican products are of superior quality. St. Domingo, furthermore, has a deposit of fine transparent rock salt and some placer gold mining. All the island requires is peace, stability, a moderate current of desirable immigration, capital and enterprise.

The island occupies an enviable geographical position, about two-thirds of the Great Antilles, with an area of 53,343 sq. km. and a population of 350,000, divided into five provinces and five maritime districts, each under the rule of a governor. The capital, Santo Domingo, has 20,000 inhabitants. The Bay of Samaná is the largest and safest harbor in the West Indies; it may, by some suitable arrangement, eventually be acquired by the United States, should the people of St. Domingo then feel disposed to sell it for a good, round sum. It has a great strategic value in view of the eventual canalization of the isthmus of Panama, or the digging of the Nicaragua Canal or the building of the Tehuantepec Ship Railway. What Pearl River is to us in Hawaii, Samaná Bay would be in St. Domingo—a great naval *entrepôt*, ready for all emergencies.

The national indebtedness is trifling; the home debt does not exceed $1,499,982, and is gradually being canceled by 15 per cent. of the import duties. Hayti still owes St. Domingo $824,378. General Marchena has recently proceeded to Paris, accompanied by a financial agent of the Government, in order to negotiate a loan, part of the proceeds of which are to consolidate or cancel the foreign debt, together with arrears of interest due. Thence he will go to London, where some financiers seem to be prepared to start a national bank at Santo Domingo City. The revenue of the Government in 1885 was $1,409,566; the expenditure, $787,164. Meanwhile the Government has granted a concession to American capitalists for the construction of a railroad from the city of Santo Domingo into the interior of the island via San Cristóbal, and, besides the grant of valuable lands, have pledged the issue of a large amount of 8 per cent. Government bonds, secured by public revenues, as a subsidy. Since the beginning of February a cable has been laid to connect St. Domingo with Curacoa, while other lines are to connect Puerto Plata with Santiago de Cuba. Land lines connecting Puerto Plata, Santiago de Santo Domingo and other inland towns with Santo Domingo City will soon be in working order.

The maritime movement was as follows in 1885: Vessels entered into the port of Santo Domingo City, 196; at Puerto Plata, 137; Monte Cristy, 106; Samaná Bay, 79; Maconis, 43; Azua, 28, and Barahona 11. The postal service was conducted the same year by 44 offices, dispatching 226,535 letters and postal cards, and 92,077 newspapers, the receipts amounting to $7020 and the expenses to $17,453. As for Dominican foreign commerce, the import in 1885 amounted to $2,104,369 and the export to $2,544,403. The chief articles exported were tobacco, sugar, coffee, honey, beeswax, mahogany and other cabinet woods, lignum vitæ, logwood and fustic and some tortoise shell. The exportation of guano had fallen off materially, but has latterly been actively resumed.

American trade with St. Domingo shows the following fluctuations:

Fiscal year.	Import.	Domestic export.
1883	$1,417,519	$1,179,200
1884	1,439,853	1,257,969
1885	1,461,419	962,428
1886	1,656,131	1,017,265
1887	1,390,126	1,014,414

The sugar importation from St. Domingo into the United States was:

Fiscal year.	Pounds.	Fiscal year.	Pounds
1880	10,180,946	1884	32,006,573
1881	15,037,883	1885	42,522,746
1882	16,417,334	1886	39,018,824
1883	27,281,049	1887	42,054,795
Totals	68,917,216		155,597,938

Increase 86 680,722, or 127 per cent.

The bulk of these increasing amounts of sugar we receive from that quarter is from plantations owned by Americans, and a goodly portion of the proceeds is reinvested in sugar machinery and portable railways for plantation use, thus keeping up a moderate movement remunerative at both ends, capable of indefinite extension. As the above figures indicate, the share which the United States have in Dominican trade is overwhelmingly large; it is susceptible of expansion if certain modifications should take place in our customs tariff, and enabled us, for example, to compete with the Germans in securing tobacco from Puerto Plata, in which event an extraordinary impulse would be given to tobacco culture in the great Dominican "Vega," stimulated and facilitated by the railroad that is to transverse it. The ball now being set in motion, there is no saying what developments may come in the near future if Dominicans will but abstain from political disorders, which we feel confident they will.

The Hocking Valley Case.

The annual report of the Columbus, Hocking Valley and Toledo Railway Company for 1887, under its new management, has an interesting account of the manner in which it is claimed the investors in the stock and bonds of that company were defrauded out of $8,000,000 by Judge Stevenson, Burke and his associates. These men in 1881 arranged with the banking house of Winslow, Lanier & Co. to borrow $6,000,000 from them, agreeing to pay therefor in four months from the proceeds of their contemplated scheme. It is asserted that by threats of building parallel roads they secured the stocks of the different railroads, which they merged into the present system, at the same time authorizing a mortgage of $8,000,000, of which bonds for $6,411,000 were sold by the banking house and applied by it to the extinguishment of the original debt, not a dollar reaching the treasury of the railroad. Thus the railroad bought itself by its own mortgage, and Burke and his associates paid nothing for the stock they owned. Meanwhile these same men had formed themselves into the Hocking Valley Coal and Railroad Company and had bought 10,000 acres of coal land by giving their notes. Then, as directors of the Columbus, Hocking Valley and Toledo Railway, these same men purchased for $8,000,000 from themselves these coal lands which they did not own, and these lands (worth $800,000) were included under the railroad mortgage as an asset of the railroad company. As they had already paid Winslow, Lanier & Co. $6,411,000 of this amount, they proceeded to divide among themselves the difference, $1,589,000. It is claimed that of the total mortgage bonds for $8,000,000 the railroad has not and never has had anything to show except the coal lands, worth but one-tenth of that sum, and even the certificate of ownership of these lands is missing. The present management has committed itself to the task of recovering these plundered assets through the courts of Ohio.

These transactions as presented raise some important questions. It is claimed that the innocent purchasers of the bonds and of the stock from Burke and associates were swindled. If they were, did they secure the protection to which they were justly entitled? It may be acknowledged that it is no part of good law or of good social economy to keep a fool and his money together. Wild investments of capital without reasonable investigation cannot be

protected by any power. It is agreed however, that there are many corporations enfranchised by the State in whose financial soundness the citizens are vitally interested, and yet a competeht knowledge of whose affairs is beyond the powers of the majority of men. Banks and insurance companies are examples, and it is considered that the State does but its simple duty in keeping a rigorous watch upon their solvency. Whether the State should examine rigorously into the affairs of public corporations other than those mentioned is a debatable question—debatable rather as to its necessity and expediency than as to its rightfulness. In the beginning of our railway building, the finances of the small companies were as simple as those of a factory. Almost any one with but little trouble could inform himself of the reasonable value of railway stock and of the honesty of its accounts. Now all that has changed; it requires the long labor of experts to ascertain the true condition of our modern complicated systems with accounts so abstruse. Certainly it is far beyond the ordinary investor; while errors of whose existence the officers may be ignorant, may have upon the innocent holder the effect of a downright robbery. The Baltimore and Ohio is a case in point. Their published reports show an exceptionally small capitalization with a surplus of more than $40,000,000; yet the road found itself short of money and unable to borrow except on hard terms. It is now charged that the report did not reveal the true state of affairs—that a leased line, for example, which was operated at an actual loss, might be credited with paying 10 per cent. into the general treasury, and so a surplus be shown which was wholly imaginary.

It was the growing feeling as to the necessity of better protection for the small investor which led so many prominent New York firms to petition the Stock Exchange for the appointment of an auditor who should pass upon the stock and bonds dealt in upon the Exchange. But grave difficulties present themselves. In the first place, such an auditor is in a measure already established in the persons of the listing committee whose indorsement is supposed to be given to none but reliable securities. But from the nature of the case, the Stock Exchange cannot warrant the stocks and bonds it buys and sells. To do so would entail such great labor and expense as to prove impossible for any single commercial body, however powerful, to undertake it, especially without any legal power to take the first steps toward a practical result. If, however, our people should determine in the future that some impartial examination of railroad accounts was necessary for the protection of small capitalists on the one hand and of the shipping public in the matter of freight rates upon the other, we have already the machinery which could be used for such a purpose—the Railroad Commissions, both State and National. It would be entirely within their natural lines of duty, requiring only increased force and increased expense to give full publicity to doubtful pieces of financiering, leaving, if we please, the actual wrongs to the courts as now. It is reasonably certain, if such a rule had been in force in Ohio in 1881 and 1882, that the schemes of Judge Stevenson, Burke and others would not have cost innocent holders their money, nor, if generally employed, would our railroad history be disgraced by so many flagrant wrongs which, by losing us the confidence of foreign and native investors, have turned from important enterprises millions of capital needed for the development of our country.

Child Labor in Chicago Factories.

Attention has recently been called to the subject of child labor in factories in Chicago. Public sentiment on this question had long been dormant, notwithstanding the following enactment in the State code: "No person having the right and power to prevent the same shall knowingly cause or permit any child under 15 years of age to be employed at night in any place where machinery is used or more than eight hours in any day at any trade or employment, and then only between the hours of 7 a. m. and 6 p. m." Recent occurrences in a shoe factory brought out incidentally the extent to which child labor was depended upon in that establishment, which had the effect of awakening public opinion. The Committee of Abuses of the Trades and Labor Assembly have determined to take vigorous action, prosecuting employers wherever they are found violating the provisions of the law. The first case taken up was that of the shoe factory cited. It was shown that children of tender years had been employed for full working days as though they were adults, and as though no restriction had been placed upon their hours of labor by law. The defense set up was that the children were employed at very light labor, and, further, that an injustice was being perpetrated in singling out this firm for punishment when they were merely doing what hundreds of other Chicago employers were doing. Nevertheless the full penalty of the law was imposed, $200 fine and costs, the justice before whom the case was tried remarking that it gave him pleasure to endeavor to carry out the provisions of a law so manifestly necessary to protect children from the greed of employers and the heartlessness of parents. The matter will probably be contested hotly in the higher courts.

The report of the Health Department of Chicago, which has just been issued, gives some interesting statistics on this point. It states that of the total number of persons employed in the factories of the city in 1887 over 6000 were children under 15 years of age. This large number shows in itself that the provisions of the State law are being disregarded. Factories are not usually run only eight hours a day, and it is highly improbable that any considerable number of these young employees are relieved from work before the whistle sounds for general dismission. The health officers assert that they endeavor to carry out the provisions of the law, but that they are often thwarted by parents who are willing even to take oath that their children are 15 years of age rather than be deprived of their little earnings. In some cases, it is true, children are the sole dependence of infirm disabled parents, and the strict enforcement of the law would then work a hardship, but generally children who are compelled to toil at an early age are the victims of indolent or rapacious parents from whose cruelty they should be mercifully protected. With an aroused public opinion to back the health officers, and their more vigilant inspection of factories, together with the strong propelling force exerted by the representatives of organized labor, the welfare of the children of Chicago will probably be looked after more closely in the future.

How many other cities in the United States are now neglecting this important question it is difficult to estimate, but it is safe to say that in very few of them it is receiving the attention which it deserves. Probably the treatment of animals is in some localities an object of far greater concern and excites more interest than the employment of small children in toilsome occupations and without the needed opportunity for healthful recreation. The Illinois law is defective, inasmuch as it permits children of any age to be employed, provided they are not kept at work longer than eight hours a day, but even in its laxity it has not been fully enforced, and this may be the case in many other States and localities. The glory of the United States has long been its well-paid labor and the exemption of women and children from obviously unsuitable occupations, and the time has not yet arrived for lowering this standard.

We have been permitted through the courtesy of a prominent tin-plate importing house to examine privately compiled tables giving the imports of tin plates by percentages at the large seaports of the United States. A study of the figures, which date back a number of years, discovers some curious facts relating to the varying growth of the imports of different cities. Of course, no such table can be prepared with absolute accuracy, for the simple reason that some plates are always shipped direct to inland ports of entry; nevertheless a person who is conversant from long experience with the tin-plate trade can determine pretty closely through what channels the imports are distributed. We feel safe in saying, therefore, that the figures given below are, in the main, correct. To illustrate the shifting course of the import trade in tin plates, we have compared the percentage columns for the years 1860 and 1887. During the former year, the total imports, roughly speaking, were 700,000 boxes, which amount grew to over 4,600,000 boxes last year. In 1860, over 85 per cent. of the tin plates brought to this country came into New York, while in 1887 less than 45 per cent. were entered here. It will be thus seen that the reduction of total percentage during the past 27 years was nearly one-half, though, from the enormous increase of the trade, the actual imports of tin plates by way of New York rose during the same period from about 600,000 to over 2,000,000 boxes. The imports at Philadelphia in the meantime increased from 2.7 per cent. or 18,900 boxes, to 17.7 per cent. or 817,000 boxes. Baltimore has likewise shown a large increase, the percentages for the two years being, respectively, 1.3 and 16. At Boston the imports of tin plates, according to percentages of the whole, have remained practically unchanged, being 4.6 in 1860 and 4.5 in 1887. San Francisco is the only port showing a decrease in receipts, the imports havin fallen from 6.2 to 4.3 per cent. New Orleans, which had nothing to its credit at the earlier

date, now imports nearly 2 per cent. of the tin plates brought to this country. The most remarkable change, however, is noticeable in the case of Portland, Me., which, importing nothing in 1860, received, in 1887, 11 per cent. of the total, or more than 500,000 boxes. This increase in trade is due largely to the growing demand for plates in the West and Northwest, Portland being a convenient receiving point. The Canadian trade is also diverted there during the winter months on account of the ice blockade further north.

OBITUARY.

SAMUEL SMITH, one of the oldest manufacturers of Paterson, died the 28th ult., aged 73. He started the locomotive works of Sarnhime, Smith & Co., in 1848. This was afterward incorporated as the New Jersey Locomotive and Machine Company, and Mr. Smith became the president. He was also one of the old firm of Rafferty, Smith & Co., machinists, and during the last years of his life he carried on the business of boiler making, his establishment covering 30 city lots in Railroad avenue.

HENRY E. PIERPONT died 28th ult., in the 80th year of his age, at his residence in Brooklyn. His life was devoted to the development and care of many of the large corporate and financial institutions which have grown with the city. He was among the founders of the Union Ferry Company, and was its president at his death; also of the Greenwood Cemetery corporation. He was a founder and director of the Brooklyn Trust Company, the Brooklyn Savings Bank, the Brooklyn Academy of Music, the Brooklyn Historical Society, the Hamilton Club, the Brooklyn Club, of which also he was a long time president, and of the Geographical Society, of New York.

A telegram from Jacksonville, Fla., announces the death of ALFRED HUNT, president of the Bethlehem Iron Company, age 72. Mr. Hunt was traveling for the benefit of his health.

The thorough training of youth for commercial pursuits as a part of the curriculum of English universities was discussed by Sir John Lubbock, before the associated chambers of commerce, in London. He particularly urged a better acquaintance with modern languages. Owing to the deficiency of the English youth in this respect, Sir John declared, commercial firms were compelled to employ foreigners to represent them abroad. The report of almost every British consul abroad on the subject of the falling off in the trade with foreign States dwelt with considerable emphasis upon the fact that this decline, to a large extent, was owing to the want of acquaintance with the language of the country on the part of the English representatives of many of the business houses abroad. But Sir John Lubbock's resolution not only provides against a continuance of this system, but also endeavors to encourage English youths to qualify for an occupancy of the places in offices at home which are at present held by foreigners. In New York business houses the presence of foreigners who have command of the languages of countries represented by them is always noticeable.

The South Chicago Works of the North Chicago Rolling Mill Company have again put upward the record mark. Our Chicago office telegraphs us that the March product was 24,134 tons of ingots and 21,095 tons of rails in 49 turns. One furnace was out of blast or the product would have been larger still.

Copper Speculation.

Its Effect Upon Manufacturers.

Through the public prints sensational accounts have been given currency in regard to the speculation in copper, often highly colored, in the interest of those engaged in the manipulation of the metal. American producers, won over or bullied into acquiescence one by one have apparently decided to make the best of their present opportunities, although many of them acknowledge that the excessive advance must ultimately lead to a long period of depression disastrous to all but the strongest. The views of manufacturers of the many articles into which the metal enters largely or exclusively as a raw material have not been heard, so that the following letters from a large number of the leading manufacturers of copper in different branches will go far toward defining the attitude of this interest, whose influence is far-reaching and is backed by the sentiment of the trade at large. We may state that in order to narrow down the discussion to specific points we addressed the following questions to our correspondents:

1. Has the volume of your business, considering the general condition of trade, been adversely affected by the rise in raw material?

2. What is the substance of your information from dealers and consumers of your line of goods?

3. Have prices of manufactured goods kept pace with the rise in copper?

4. What are your views on the effect of present prices for raw material, if long continued, upon the interest of manufacturers?

The situation is regarded as follows by one of the greatest steam-pump makers of the United States:

We have yours of the 27th relating to the copper situation, and relying on *The Iron Age*, as manufacturers do, for many points, we feel that they should, as far as possible, assist in the collection of reliable data. While we do use in the articles we manufacture large quantities of copper and tin, we are not strictly makers of brass goods. As to the effect of the present high price of copper on the volume of business, we have to say that we do not find that it has so far affected our business adversely; but we do hear brass goodsmen say that it has done so to a considerable extent in their lines; and the uncertainty as to the price being sustained, doubtless prevents many from making large purchases. Again, when copper was at its lowest, it was largely used for purposes which its present high price has made prohibitory. While we have been obliged to make an advance in the price of some of our goods, we have not done so equal to the advance in copper and tin. Our views on what the effect will be in the long run, if prices are kept as they are, that copper will only be used for such purposes as make its use imperative. But for ordinary trade purposes, whenever the trade become satisfied that the price is fixed, and that it will not drop, the demand will not be largely reduced.

A very large iron founder expresses himself as follows:

The copper that we use in our business is but a small amount, not running over 100 tons a year, and the cost of the goods in which we use it depends so little upon the value of the copper that the sale is not, and probably will not be, influenced by the advance of prices. We are not in a position to answer your queries as we would like, and we shall hope to see them discussed by others through your columns. There is, however, but one outcome to an unnatural price, and that is an eventual collapse. When it will happen those familiar with the details can tell better than ourselves. We consider it only the part of prudence to carry as small stocks as possible, and only buy from month to month.

A manufacturer of plumbers' brass goods writes:

The great advance in copper and tin has very materially affected our business, as our customers are among the jobbing trade, and they are all buying light, unless they can get some part of the advance. That is, taking the cost of manufactured goods to-day as compared with copper at 10 cents, if the manufacturer was fortunate enough to have copper on hand and will allow them a part of the advance, they will order to a larger amount. This is not, in my opinion, good business. The jobbers complain of very poor trade, stating that they have almost no orders. Manufactured goods have not advanced as much as metals, and if present prices are long maintained we look for much lighter demand for goods.

A leading firm of makers of brass goods and plumbers' supplies put themselves on record as follows:

volume of our trade has been somewhat affected by the rise in raw material. We advanced our prices to conform to the advance in metal, but our customers lacked faith in the permanency of the advance. The trade always look with suspicion upon an unnatural advance in raw material. They know that copper can be produced at a profit at 10 or 12 cents, and hence there was a general disposition on the part of our customers to hold off. In buying, they would buy only as their necessities demanded. I suppose the effect would be if the present prices could be maintained for any length of time that the trade would adjust itself to the conditions. I hardly think that the demand for our goods would be less because of the advance, as the demand largely depends upon the amount of building done, and I hardly think building operations will be checked because of the advance in brass goods, as this will be a small factor in the cost.

From a company prominent as manufacturers of valves we have the views given below:

Last summer we contracted for an amount of copper which will supply us until the 1st of July of the present year. We have not advanced our prices to the extent which the rise in copper would warrant, feeling that whatever might be offered as an argument to sustain the relations of the syndicate to the market it would not hold in spite of all the capital that is back of it, from the fact that with the large amount of copper that is and can be mined in this country it would be a very hard thing to hold it at a price beyond which it could be fairly afforded for. We believe that the syndicate will be forced to lower their prices within a year to 14 cents, at least, for Lake copper. We hold that the consumption of copper for ordinary manufacturing purposes will be largely decreased in certain lines of business, consequently the sum total of copper which will be carried by the syndicate in less than a year will be such that they will sell at 14 cents rather than to accumulate very largely, and they could well afford, as we understand, to make prices 14 cents in New York for Lake copper and then do a good thing for themselves. It will be a hard thing to do to hold copper at 16 cents against the fact of the increased production and decreased consumption in some of the arts. In regard to the effect on our business, as said before, we have not raised our prices in the same ratio that copper has advanced, and would say that our present orders and prospective orders are good, probably keeping us busy for the season.

Another valve-maker writes as follows in reply to our inquiries:

While our business is not so driving as it was last year, we hardly believe that the falling off is due to any extent to the rise in prices of copper and tin. We are selling our iron valves, brass mounted, at lower figures than last year, and have reason to believe that the speculative rise in copper and tin has reduced consumption in these metals, leading to the substitution in some instances of other materials. A manufacturer of sheet copper has informed us recently that formerly they sold sheet copper for covering sheet buildings, but now this demand has fallen off, cheaper metal being used. We are very confident that there will be a larger increase of tin and copper, which, with a lowering of consumption, will sooner or later cause a great falling off in these metals and lead distress to some who are not lucky enough to unload, as also to those who have invested their money in mining copper without being able to produce it at a low cost.

Still another valve-maker writes:

1. The volume of our business has not yet been appreciably affected by the advance in price, because we made no change in prices until about March 1. We had such a stock of copper on hand that we continued to sell at old prices, hoping the price would not remain at 15 or 16 cents.

2. When we undertook to advance prices (you know we made a specialty) we were told that some of our competitors (who are new in the business and not as well established in the market as we are) had not advanced, and we

must not. Of course, since we have not yet formed a "pool" or "trust," we cannot control these competitors, and it begins to look as if we would have to stand all the increase in the cost of metal and let the "dear public" have the goods at old prices—*i.e.*, to hold our trade we will have to give the copper pool thousands of dollars in the next year, which we would naturally prefer to put into our own pockets.

3. Prices of manufactured goods have not kept up with the advance.

4. If present prices of copper are maintained, I believe the result will be disastrous to manufacturers.

Individually, I believe in stable prices—*i.e.*, that coal, iron, labor, metals, &c., should not vary much in price. If all keep at prices which pay fairly well, it is better for all concerned—much better than alternately high and low prices. I would prefer to pay $5 for coal than $3; $20 for No. 1 iron than $17; 12 cents for copper than 10 cents, &c., if these price would be continuous for five years. We could then sail smoothly and make our ports, and pay our taxes.

From a manufacturer of brass and copper tubing we have the following exhaustive letter:

Replying to your inquiries of the 27th, we desire to thank you for opening your paper to the discussion of the copper interests of the country, and have no doubt some very interesting and instructive information will be elicited. There is no question but that our business has been materially and adversely affected by the abnormal advance in the price of copper. It has cut down our sales at least 25 to 33⅓ per cent.; dealers are not ordering stocks, and consumers are buying only as their immediate wants compel them. As compared with the highest quoted price of ingot copper during the past three months our goods (brass and copper seamless tubes) have not been advanced proportionately. A change was made in the price list in February last, but not to the extent the increased cost of the raw material would have justified; those prices are still maintained, though to be fairly remunerative they should be at least 15 or 20 per cent. higher; that they are not is due to the fear that such an advance would entirely stop all business in that line.

We are of the opinion that the operations of the syndicate for the past few months have been most unfortunate for copper interests generally; the low prices formerly ruling had stimulated consumption, fostered new enterprises and induced the substitution of copper for other materials, particularly in the electric, telegraphic and building interests. The demand from these sources has received a serious check in the artificial advance in price; had it been allowed to progress, increased consumption would have caused a natural rise and a healthy condition of trade. Producers who had been kept out of the market by low prices would have resumed operations only as the natural course of trade made business remunerative to them; under present conditions, however, over-production is certain to take place; every mine that can be worked at a profit will go into operation and the syndicate will have to take care of a perfect flood of copper. In our opinion their ability to do this is the chief if not the only factor in the problem of future prices. It is evident that the higher rates are pushed the more burdensome the load will become, and a conservative policy should forbid the forcing of any further advance; we think 13 or 14 cents at most should be the limit. These figures offer ample, in fact princely, remuneration to enough producers to keep the market fully supplied. Those only whose topographical situation places them disadvantageously would complain; only the fittest would survive, and poor property could not be galvanized into a delusive and factitious semblance of value; consumers would not complain, dealers would be satisfied, and manufacturers could formulate some definite plan of operations.

As the matter now stands, all alike are at sea. The syndicate claims to have secured control of nearly all the most important sources of supply. This may be true, but statements and facts occasionally crop out which would indicate their claims are false, and the consequent doubt unsettles all interests. The combination is generally believed to be exceptionally strong financially, but just how strong is unknown, except to themselves. If, as they claim, they can control the price of copper, whether it be for six months or six years, their best policy would appear to be a convincing proof of the fact, coupled with an assurance that prices would be held at a certain fixed figure, which should be one that would afford a profit to themselves without antagonizing the manufacturers, say from 13 to 15 cents. Such a course would settle matters and effectually dispose of the uncertainty which is now hanging over the market and working disastrously to all interests concerned. Unless some such conservative course is pursued manufacturers will be compelled to take some concerted action for their own protection. There are doubtless valuable copper properties yet to be had; money enough can be commanded, and the interests involved are of sufficient magnitude to warrant an effort to relieve the business of its present incubus. It is certainly not very complimentary to native shrewdness to have allowed the existing cornering operation to have assumed its present proportion, nor is it at all creditable to American patriotism that the owners of large properties of more than national interest should have stultified their nationality by selling out to a grasping and rapacious foreign monopoly.

A Waterbury manufacturer expresses the following interesting views:

There has been some diminution in the volume of business coincident with the increase in price of copper, and doubtless to some extent due to it. Exactly to what extent is not easy to say. Customers are inclined to order sparingly, limiting their orders to present wants, doubtless influenced by an expectation of a return of lower prices. So far as it is merely this and nothing more, the trade will come; but in all these cases there is a check on new enterprises and new uses, varieties, patterns, &c., the aggregate effect of which on trade must be very considerable. With such goods as are manufactured by us, being sheets, wire, &c., largely to be remanufactured, prices have generally kept pace with advance in copper. The margin on this kind of business being small the advance is a necessity; as we near the finished products, especially if the margin is considerable, the price of the raw material is likely to be less closely followed. This whole question of a continuance of present prices must be viewed with reference to the fact that the price of copper until within a short time has always been higher than it is now. The market of the world and the uses to which copper might be put had not fully adjusted themselves to the new condition when the reaction came. If, however, copper were to continue at its present price it would still be some time before buyers will cease to expect lower prices. This will be based on the fact of a general belief that at the present time copper enough to supply the world can be furnished at about 10 cents per pound, and still pay the miner a handsome profit. Heretofore this has not been true. The tendency of this expectation of lower prices will be to limit trade. It will also of itself tend to lower prices, and, unless counterbalanced by other influences, will do so. If, however, it should come to be generally believed that copper is not going lower trade will resume its accustomed course, and the effect of the change will not be materially felt. But we shall not know what might have been the effect of continued low prices. The subject presents an entirely different aspect from what it would had the price of copper been at 10 or 11 cents for many years, and then had suddenly jumped to 16 cents. It is now simply a case of a moderately rapid decline, followed by a sharp recovery. Faith in the permanence of such prices as were ruling had not become sufficiently fixed so that they were universally accepted as a factor in the market. They were getting to be, but the point was not reached.

A concern making roll and sheet brass, wire rods and tubing, reports as follows:

The volume of our business has fallen off fully 50 per cent. from what it was before the advance in copper commenced. From the best information we have from dealers and consumers we think the general tendency is toward a hand-to-mouth policy, none of them having any confidence in prices for any length of time, although we think we have met more persons lately who believe that the present price of copper will be maintained for some time. Prices of manufactured goods have been advanced, but not as much as the advance of raw copper. If present price of raw material is maintained for any length of time we do not think it would be to our interest. We are pursuing the same policy in reference to purchasing that our customers are—that is to say, if we do not have orders we shut down. We keep on hand barely stock enough to keep us running. We think it would be a good thing for the trade generally if there was not so much mystery about the so-called French syndicate. If they would show their hand and offer their copper to consumers, guaranteeing them against a decline, we cannot believe that the advance has been so great that it would check trade in any considerable amount.

A leading producer of brass goods, including car trimmings, bearings, hardware, &c., sends us the following communication:

1. The general condition of our business has been adversely affected by the advance in metal by reducing trade.

2. Our customers will only buy for pressing wants during the continuance of present prices.

3. The prices of goods manufactured by us have not kept pace with the rise in metals.

4. I regard the present condition of the market in metals as very unfortunate, since it is likely to have a bad effect on many manufacturers. The market now being in the hands of speculators we will not buy anything more than we need from week to week, and reduce our output to the lowest, knowing it would be unwise to pile up stock with copper at 16 cents per pound, when we believe in the near future we will probably buy it at 10 cents per pound. As most of our customers are of the same opinion restriction in production will be the order all around in our line of business while speculative prices are maintained. The price of copper and tin is outrageous at present and unwise in the highest degree. Had an advance been made to 12 cents per pound for Lake copper it would have been reasonable, and, while helping the mining companies, would not have had any material effect on consumption of copper; but now, instead of our buying and carrying a fair stock of copper, as we ordinarily would, we allow the speculators to do that, and as a large part of the consumers of copper are doing the same we think the result of a collapse in the copper trust is not far off, and hope they will get completely cleaned out when it does come, as it certainly will. High prices as usual foster production while causing restriction of use, and the copper trade of the world is a big undertaking for a few capitalists to manage. While we sold over 400,000 pounds of copper last year, and only used about 180,000 pounds in our factory, this year we have decided to sell no copper, owing to the uncertainty and changes in the market, and restrict our purchases to lowest amounts required in our works until prices return to a reasonable basis.

One of the leading brass rolling mills, who are manufacturers also of wire and tubes, state that the volume of their business has been adversely affected by the rise in raw material, and that the tenor of their information from consumers is similar in its character. They join in stating that the prices of manufactured goods have not kept pace with the rise in copper, and express the opinion that a long-continued maintenance of the high prices of raw material must be very injurious to the best interests of manufacturers.

A western brass works replies to our question as follows:

The recent advance in copper has affected the volume of our business very seriously, reducing it from one-third to one-half. The information that we received from our customers and dealers generally agrees with our own experience. The prices of manufactured goods have not equalled the advance in copper and tin by one-quarter to one-third. We unequivocally regard the operation of the so-called "French syndicate" as very disastrous to the metal-working interests of this country, involving alike the manufacturer and the workman. The advance in copper and tin by this syndicate is artificial and absolutely without reason, other than the purchasing power of unlimited capital. To enable this syndicate to thus rob the public, the whole metal-working interests of the world must be utterly demoralized and unsettled. The trade generally regard the "corner" as likely to collapse at any moment, hence they buy only for immediate wants. The long continuance of present rates, say for a year or two, would sooner or later restore confidence in the permanence of prices, and to a certain extent business would resume its normal condition. But manufacturers are and would be under the constant fear of a disastrous fall in the price of the raw material, thus entailing a ruinous decline in their manufactured products. The history of the copper production of this country for the last two years proves that this metal can be profitably marketed at a price not exceeding 11 cents per pound, the present rate of 15 to 16 cents, is with the present cost of production, unnatural and is sure to result in a feverish stimulation to the production of the whole world, with the equally certain over stocking of the market and disastrous reaction that will bring ruin in its train. Meantime the manufacturing interest are greatly depressed and thousands of workman are without employment as a direct result of this iniquitous trust.

A brass works in Ohio reports that the volume of the business done has not been adversely affected by the rise in copper, nor do reports of crippling of this kind come from dealers or consumers. Prices have not kept pace with the rise. If pres-

ent values are continued the effect must be injurious, since the ingot copper purchased before the advance is being well worked up, and, as there has been no corresponding increase in the price on manufactured goods, the result must be a heavy loss to the producers. How serious the situation is is just beginning to be realized, as great quantities of old materials which have accumulated during the period of low prices are now being utilized. As soon as this supply gives out we shall be compelled to pay the advance prices for ingot copper.

A Western brass rolling mill gives the following report on the situation:

We cannot say that the rise in raw material has affected our business, but, on the contrary, think that it has to some extent benefited it. Here the price of manufactured goods has increased in proportion to the price of raw material, and we believe that if copper were to remain as it is business would soon become settled and prices satisfactory. As it is now, manufacturers do not care to place any large orders at present prices, since they are waiting to see where the market will go. Some of them had large supplies on hand before the advance and are working them off at good prices. Orders are coming in very plentifully now and everything promises a good season.

One of the largest concerns in the country, as brass and copper manufacturers, state:

The volume of our business has been seriously reduced by the rise in raw material. Those who buy from our customers purchase only for immediate wants, as they fear that present prices are not going to be maintained. The result is that our customers buy from us in the same manner. The price of manufactured goods has not kept pace with the rise in copper. From present indications we believe that the advance has come to stay at least during 1888, and that the trade is generally beginning to come to that conclusion. Our orders have increased quite satisfactorily during the last ten days. If copper is kept at about 16 cents for 12 to 18 months it will have the effect of checking the consumption. We know of builders who have substituted galvanized iron for gutter leaders, bath boilers, &c. With the stimulation of the production all over the world, which must come, we expect in 1890 to see very low prices for copper.

A producer of sheet brass, lamps, bronzes, kettles, &c., reports:

The volume of our business, considering the general condition of trade, and considering particularly the present tie-up on the Western railroads, is greater than we could have had reason to expect—considerably greater than it would have been had it not been for the rise in the price of copper and other metals. This is due to the fact that manufacturers of brass goods generally, and particularly burners and small brassware, did not advance the price to any considerable extent; certainly not in a proper ratio to the advance in the price of metal. Large dealers have been prompt to take advantage of this fact and have ordered heavily, so that while the volume of our business since December has been exceptionally large the profits on the class of goods above named have been *nil*. We do not suppose that this can continue long, and trust that manufacturers will be brought to their senses, and that there will be a general and legitimate advance in the price of burners and similar brass goods. The price of copper, whether 10 cents or 17 cents, makes but little difference to our business or to our profits if one price could be steadily maintained. Considerable fluctuations in the market destroy confidence in metal values, and are our worst enemies as regards profits. We feel satisfied that the action of the present French syndicate and its American fellow conspirators will, in the long run, prove a benefit to the world at large, and particularly to this country. As a consequence of this bull movement the copper deposits of Montana, Arizona and British Columbia will be opened up under the stimulus of the present prices.

Replying to the question whether business has been adversely affected by the rise in raw material, a brass manufacturing company of the Naugatuck Valley state that their production has been diminished fully one-third by the advance, business prior to it having been very large in volume in this line. Our correspondent holds that the effect of present prices for raw material, if long continued, will be to lead largely to the substitution of iron and steel for brass, so that when low prices come, as they must, great difficulty will be encountered in diverting brass back to its legitimate channels. Prices in the line in which our correspondent is engaged have not by any means kept pace with the rise in copper, since an advance in prices equivalent to that made in copper would have practically paralyzed the business. The manufacturer in question reports that dealers and consumers are beginning to realize the character of this artificial movement to bolster up the price of a commodity of which our country has an abundance. It is a serious matter to the trade, and one prejudicial to the bests interests of manufacturers. The public are so familiar with the published cost of production of copper, which is undoubtedly correct, that they cannot reconcile themselves to the situation as it now is.

A Connecticut manufacturer writes:

The volume of our business has fallen off considerably, the trade not buying at first, in hopes, as they say, that "this will not last." Lately, however, we have had a fair business. Still no one is buying ahead, as they have always done for some time past. Several new avenues for copper have been closed since the rise. For instance, copper roofing was coming into general use, but has now dropped two-thirds. Dealers say that if the price could be kept up it would have a good effect, but they think that prices cannot stay there. The rise in manufactured goods has kept pace with the rise in copper. We do not think that a continuance of high prices will have a good effect upon the interests of manufacturers. We have at this time of the year for years past been very busy on orders for the spring trade, but it has almost entirely disappeared. Of course we think it is owing to the high price. We also think that when this combination breaks it will be necessary to "look out." We have generally not been afraid to keep a good stock of raw material on hand, but propose to keep near the shore for some time.

A company which stands at the head of its line of business in the West, being manufacturers of radiators and heating appliances, report that as yet their business has not been adversely affected by the rise in copper, nor do they, from their standpoint, object to present prices. The figures realized for manufactured goods have not kept pace with the rise in copper because it was possible to draw on old stocks upon which sellers wished to realize. In this particular line our correspondent does not look forward to any special effect as the result of a long-continued period of high prices. They add: "We, of course, deprecate anything that increases the selling prices of raw material, and if iron should join the 'booming' it would have a bad effect on our business by curtailing consumption. Brass goods being so small an item in the general line, an advance in them does not materially change the cost of a complete job of heating."

The Desplaines Mfg. Company are now operating at Joliet, Ill., the wire-drawing and barb-wire plant formerly owned by Kraft, Gross & Co., and the Illinois Wire Fence Company. The works were built in 1882. The wire mill contains 22 wire blocks and a galvanizing department, and the machinery throughout is of the most approved pattern. When running full the company will employ 140 men and will turn out daily 40,000 pounds of finished wire, 20,000 pounds of galvanized wire, and 12,000 pounds of barb-wire fencing. The officers of the company are practical men, of large experience in this branch of trade. Their names are as follows: James O'Brien, president; Augustus C. H. Kraft, secretary and treasurer; Louis A. Kraft and the first-named gentleman, directors.

The island of Formosa is now connected by cable with Foochow, on the mainland, and thus brought in direct connection with Europe and America. Formosa teas will become better known.

WASHINGTON NEWS.

(*From Our Own Correspondent.*)

WASHINGTON, D. C., April 3, 1888.

The chairman of the Committee on Ways and Means has formally reported to the House the bill for the reduction of the revenue, with the accompanying report of the majority. Representative McKinley, on behalf of the Republicans of the committee, at the same time reported the views of the minority. The bill and reports were referred to Committee of the Whole. Mr. McMillen, for the chairman, who is still much indisposed, announced that the bill would be called up in Committee of the Whole on April 17. This delay was intended to serve as a notice, and an opportunity to committees having appropriation bills in their control to get them in a state of forwardness, as no interposition on their part will be agreed to after the revenue discussion shall have commenced. It is proposed to limit general discussion to two weeks, but the Republicans and protection Democrats will have that in their own control. By united action they will be able to prolong the discussion indefinitely. Allowing three weeks for general debate, the consideration of the bill will then be carried into May. At least six weeks will be consumed in putting it through the amendatory stages, which will see the session well advanced into July. The Senate will then not yet have considered it at all. But this programme takes it for granted that no other business will interpose in the House. It is not at all improbable that after several weeks of running discussion the House will divide up the time of its sessions by giving the Ways and Means Committee two or three days a week or as many night sessions. This will only add to the delay. In the simple matter of time there is hardly a ray of hope that any concurrent action can be reached, if at all, until August or September.

There is a chance if the Republicans and protection Democrats unite in a policy of protracted debate that they will be able to talk the bill to death. The Republicans have practically decided to make their fight on the Mills bill, as they claim that as a party issue it would be better to do this than to support the Randall bill. It is not improbable that they will later in the contest propose a bill of their own in the nature of an amendment. A movement is on foot to bring about an agreement between the Republicans and protection Democrats by which the latter will support certain amendments proposed by the former and *vice versa*. This would so emasculate the Mills bill that it would not be recognized. The great fight will be on the wool provisions. The committee declined to drop wool from the free list, although they conceded every other modification which was backed by any decisive political strength.

The sugar modifications in the interests of the producers and manufacturers have won over the Louisiana delegation and two New York Democrats. It is claimed that every provision of the bill has been carefully figured out on the basis of its political strength, and that, when the voting begins, there will be some surprises. There is no question that two weeks from to-day will witness the beginning of one of the most interesting political debates on the tariff and revenue which has ever been experienced in Congress. The result would be difficult to foretell.

Architect Buffington, of Minneapolis Minn., has a pet project. He believes he can build a 28-story building entirely of iron, and says that capitalists of that city will invest in the scheme.

TRADE REPORT.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, April 4, 1888.

All branches of trade have been rather quiet, as usual during Easter week, and the markets have presented very little in the way of interesting feature. During the past two days a fair number of inquiries have appeared for Pig Iron, and the market shows a rather steadier tone all through. Scotch warrants have improved a fraction. Middlesboro' Pig is held 3d. higher, and ordinary brands Bessemer have been sold at a slight improvement, also to a fairly liberal extent.

There has been some improvement also in the demand for Tin Plate, and the market is better in tone at the revised quotations. Stocks are steadily decreasing under the influence of reduced output consequent upon the high cost of Pig Tin. The total supply at shipping ports is now considerably below that of the corresponding period of the past two years.

Business has been suspended at the Tynewydd Tin Plate Works, E. Standford & Co., proprietors, and the property is advertised for sale. The Hope Sheet Iron Works, at Tipton, have been purchased by London capitalists, and will soon be started up.

An important contract for railroad plant has come to the surface during the week. It involves no less than 100,000 tons all told, and is for Buenos Ayres. A Staffordshire firm secured the contract.

There has been quite a brisk demand the past few days for Steel Rails and Steel Billets, and the market is showing a stronger tone. Common Black Sheet Iron is rather weaker.

Scotch Pig.—A moderate volume of business at about former prices.

No. 1 Coltness,	f.o.b.	Glasgow.	48/
No. 1 Summerlee,	"	"	47/6
No. 1 Gartsherrie.	"	"	45/
No. 1 Langloan,	"	"	46 6
No. 1 Carnbroe,	"	"	40 6
No. 1 Shotts,	"	at Leith	46/
No. 1 Glengarnock,	"	Ardrossan	44 6
No 1 Dalmellington,	"	"	40/6
No. 1 Eglinton	"	"	39/

Steamer freights, Glasgow to New York, 6/: Liverpool to New York, 7/6.

Cleveland Pig.—The market firm and demand fair. No. 1 Middlesboro', G. M. B., 34/; No. 3 do., 31/6 @ 31/9.

Bessemer Pig.—Prices are again a shade higher and the market is fairly active. West Coast brands, mixed numbers, 43/6, f.o.b.

Spiegeleisen.—Only a moderate trade. English 20 % quoted at 74/, f.o.b.

Steel Rails.—The demand fairly active and prices firm. Standard sections quoted at £4, f.o.b. at works.

Steel Blooms.—The market steadier, with demand fair. We quote at £3. 12/6 for 7 x 7, f.o.b. at works.

Steel Billets.—Demand active and the market strong. Bessemer 2½ x 2½-inch, £3.18/9, f.o.b. at works.

Steel Slabs.—Market steady, but quiet. Bessemer £3. 18/, f.o.b. at works.

Steel Wire Rods.—Market a shade firmer, but quiet. Mild Steel No. 6 quoted at £5. 18/3, f.o.b. at works.

Old Rails.—Demand continues to run light. Tees quoted at £3 @ £3. 2/6, and Double Heads £3. 2/6 @ £3. 5/, c.i.f., New York.

Scrap Iron.—No material change in this article. Heavy Wrought at £2. 10/ @ £2.12/6, f.o.b.

Crop Ends.—The market remains quiet. Bessemer quoted £2. 5/ @ £2. 7/6, f.ob.

Tin Plate.—There has been more doing at easier prices. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/9 @ 16/
IC Bessemer steel, Coke finish	13/9 @ 14/
IC Siemens " " "	14/3 @ 14/6
IC Coke, B. V. grade	14/ @ 14/3
Charcoal, Terne, Dean grade	12/6 @ 13/

Manufactured Iron. — The trade fair and prices steady. We quote, f.o.b. Liverpool:

	£	s.	d.	£	s.	d.
Staff. Ord. Marked Bars	7	5	0 @			
" Common "	5	0	0 @	5	2	6
" Blk Sheet, singles	6	10	0 @	6	12	6
Welsh Bars (f.o.b. Wales)	4	15	0 @	4	17	6

Tin.—Rather in weak tone and business slow. Straits closed at £166 @ £166. 5/, spot, and £124 @ £125, three months' futures.

Copper.—Market firmer. More sales to consumers. Chili Bars, spot, closed at £80. 12/6. Best Selected, £80. 10/.

Lead.—The market active and strong, with advancing tendency. Soft Spanish, £14. 15/ @ £14. 17/6 at the close.

Spelter.—The market dull and prices weak. Silesian, ordinary, £18. 15/ at the close.

Financial.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, April 4, 1888.

There is an unsettled and unsatisfactory feeling prevalent among the mercantile classes not properly attributable to any special cause, but more readily explained as the result of concurrent circumstances, such as bad goods and a backward season, transportation by ordinary vehicles being almost impossible through a wide section of territory while the frost is leaving the ground. The difficulty in moving goods is further aggravated by the succession of strikes on Western railways, thus materially restricting purchases in New York as at interior markets. The promised restoration of freight rates among rival roads has been but partially realized. The latest accounts, however, indicate that railway managers will be compelled to act in harmony, more especially as concerns the transfer of freight between connecting lines, if they would avoid serious legal complications. Moreover it is to-day announced that the conservatives in the Advisory Committee of the Locomotive Engineers are in the ascendency, and that a speedy settlement of the difficulties may be expected. The shipments of eastbound freight from Chicago for the week amounted to 48,091 tons, against 56,829 tons during the preceding week, and against 81,220 tons during the corresponding week of 1887.

The total clearings of 36 cities last week shows a decrease of 26.5 % compared with last year, and a decrease of 24.5 %, against an increase of 5.9 % the previous week. There was a falling off of 31.6 % at Philadelphia, 30.9 at Louisville, 27.2 at Boston, 26.9 at Cincinnati, 23.4 at New York, 21.9 at Baltimore, 20.8 at New Orleans, 18.9 at San Francisco, 16.1 at Chicago, 15.9 at Denver, 6.5 at St. Louis and Omaha, and 1.3 at Wichita. Syracuse reports a gain of 42.6 %, Grand Rapids 22.9, Minneapolis and Cleveland 16.5 %, and Norfolk 15 %. In New York Friday was a *dies non*.

The 1st of April settlements were made without monetary disturbance. Interest payments on railroad mortgages due on Monday amounted to $18,693,804, against $16,686,053 for the corresponding date last year. Dividend payments due amount to $10,095,354, and the Government will pay $7,324,519 interest on 4 per cents, making the total payments over $36,000,000. Interest and dividends due and payable in Boston amount to $9,328,626, against $12,662,048 last year. These amounts released will naturally add to the bank reserves. The weekly bank statement exhibited a further loss of $267,650 in surplus reserve, which item now stands at $9,145,575, in comparison with $4,379,825 this time last year. There was a shrinkage of $1,758,200 in deposits and a loss of $1,190,100 in specie. In loans there was a contraction of $845,800. The foreign exchange market was slightly lower. One of the prime drawers reduced the nominal rates to $4.86 and $4.88. The debt statement shows that the reduction of the public debt during March amounted to $21,586,559.68. Total cash in the Treasury, $586,454,002.66.

Both Houses of Congress have now voted favorably as to the authority to buy bonds, and the Administration has been given that assurance of its power. The debate in the Senate upon the bill to authorize the investment of the surplus in the Treasury in the purchase of bonds has caused a large number of applications to be filed by banks during the past few days for the surrender of circulation and the withdrawal of their bonds from the Treasury. The idea of increasing the monthly purchase of bullion for the coinage of silver dollars by an amount equal to the value of national bank notes retired in consequence of the purchase of the bonds upon which they are based appears to have favorably impressed a majority of the Senate. It is a compromise between the issue of more greenbacks to take the place of bank circulation and the free coinage of silver.

The general markets, so far as they were influenced by speculation, were moderately active. Wheat was unsettled, advancing above 1¢ ₱ bushel and then receding, with active trading in spot stock for export, and flour moved in sympathy. Coffee was active at variable prices. Cotton shows the effects of excessive supply. Rubber is firm. Sugar slightly declined. The American Refinery at San Francisco, report says, has been absorbed by the trust, and Spreckles has fixed upon Philadelphia as the location for his $5,000,000 plant. Wholesale growers are much more active in the shipping department, and the full volume of spring trade is believed to be near at hand.

The imports of merchandise at this port last week amounted to $9,450,000, of which $2,292,000 were dry goods. Since January 1 the total is $124,445,000, as compared with $116,860,000 for the same time last year and $111,908,000 in 1886. Exports were $5,652,479, and for the year $76,644,000, as compared with $77,542,000 for the same time in 1887 and 77,969,000 in 1886. Included were 535,402 bushels of wheat, 187,798 bushels of corn, 497 bales of cotton, 6,107,715 gallons of petroleum, 5,301,636 lb of cut meats. According to the Custom-House report, the exports of specie from this port last week were $713,500, making a total of $7,173,000 since January 1, and the imports amounted to $556,000, total since January 1, $3,831,785. For the corresponding period last year the exports were $6,616,000, and the imports $4,228,900. The New York Sub-Treasury, as shown by the count just finished, contains actual cash, $158,573,411.93, of which $90,346,414 is gold coin.

The quarterly report prepared by *Bradstreet's* of the mercantile failures throughout the United States for the last three months places the total number at 3053, or 75 fewer than in the first quarter of 1887. They were distributed geographically as follows: Eastern States, 391; Middle, 722; Southern, 671; Western, 1007; Pacific, 176; Territories, 86; New York City, 151. The total liabilities were $34,108,679; assets, $17,936,584. An examination of the liabilities, which are about $4,400,000 larger than those of the failures during the first quarter of 1887, shows that nearly $1,782,000 of this increase is to be found in this city, nearly $1,000,000 in Georgia and Florida, due to disastrous cotton speculation, and about $1,300,000 in Ohio, accounted for by a bank failure at Cincinnati. The increase in this city is attributed to "dry rot."

The Holland Trust Company, with $500,000 capital, has commenced business at 7 Wall street.

The Iron and Steel Company of West Superior are locating their plant for the contemplated works, which will be on a large scale. The proposed capital is $2,500,000. The Superior *Inter-Ocean* says: The plans for the buildings to be erected this summer are not yet completed, but they will comprise the foundry and casting room, where all the machinery will be made for the steel plant, and the blast furnaces, where the ore will be reduced to pig or steel ingots. The ground, however, will be cleared of timber at once. The entire works, when completed, will cover upward of 12 acres of ground, will require one large ore and coal dock for its own use, and will finally employ about 1800 men.

How strikers are sometimes treated in England appears from a recent statement in the London *Times*. All the workmen at three collieries suddenly ceased from labor on account of a trivial dispute between one of their number and a colliery manager and the result was as follows: "At Gateshead, Petty Sessions, yesterday, 180 miners from Usworth Colliery were summoned under the Employers' and Workmen act for absenting themselves from work on the previous Wednesday, when they accompanied to the court 170 men who were summoned from Felling and Wardley Collieries for a similar offense. The representatives of the men agreed that each defendant should pay his damage and 3s. 6d. costs. In the cases of the Felling and Wardley miners, who were fined last week, distress warrants had been issued, but it was yesterday agreed that the damage and costs should be paid by installments. All three collieries are now working."

The Western Reserve National Bank, of Warren, Ohio, which holds a judgment and execution against the Warren Tube Company for $10,000, has commenced a suit in equity against the other creditors. The appointment of a receiver to sell the plant and the valuable patent for cold drawing and polishing tubing which is held by this company was asked of the court, and also that the company be enjoined from disposing of its letters patent. Judge Gillmer allowed a temporary injunction as prayed. The company is a corporation with $200,000 capital stock, and has debts amounting to $143,000. Various difficulties in the company led to its financial embarrassment, and the sale of the plant, which has been idle since last November, appears the only way of readjusting affairs.

The furnace of the Merion Iron Works, at West Conshohocken, will be blown out as soon as the present stock of material shall have been worked into saleable form.

New York.

American Pig.—Under date of April 2d Mr. B. G. Clarke has issued the following circular, the substance of which was printed in our last issue: "Our regular trade for years past have taken all the Soft Irons we made, and until 1887 we were able to deliver of 1X and 2X as required by our customers. Our furnaces for several weeks past have been making the usual amount of 1X and 2X, and should they continue to do as well in the future we will be able to deliver you the Iron as heretofore. Our prices are $19 for 2X and $20 for 1X, f.o.b. at Perth Amboy, for cash in 30 days, or for your note at four months, with interest from date of invoice." Mr. Clarke informs us that his sales to date of No. 1 and No. 2 for this years delivery have aggregated about 30,000 tons, besides which there have been sold at different times during the year thus far about 50,000 tons of Gray Forge, chiefly for Pipe purposes. The general trade here is very quiet, with sales on a moderate scale at $20 @ $20.50 for choice; No. 1 Foundry, $19 @ $19.50, and Gray Forge, according to quality, $16 @ $16.50.

Scotch Pig.—A little more activity is reported, with quotations at $20.25 @ $20.50 for Coltness; $20 @ $20.50 for Summerlee; $18.50 @ $18.75 for Dalmellington, and $18 @ $18.50 for Eglinton.

Iron Ore.—The high freights are making business practically impossible so far as foreign Ores are concerned, freights from Spain being now 16/, which is due chiefly to the fact that little outward business is offering from here; nor are the prospects as viewed by importers favorable to any business of any magnitude for some time to come. On the other hand, furnacemen are not able to pay prices at which importations can be made, and we hear of some canceling of old contracts for Ore for delivery to the Wheeling district. Thus far the sales of foreign Ores have been very moderate indeed this year. They include a block for a furnace on the Delaware River at 9½¢ a unit, and a sale to a furnace in Central Pennsylvania, the importer taking the Iron. Some of the New Jersey mines have reduced their prices 25¢ a ton.

Structural Iron.—We quote: Bridge Plate, 2¢ @ 2.10¢; Angles, 2.20¢ @ 2.30¢ for Iron and 2.30¢ @ 2.40¢ for Steel; Tees, 2.7¢ @ 2.8¢, all in round lots, on dock, and Beams and Channels, 3.3¢.

Plates.—We quote: Iron Tank, 2.10¢ @ 2.25¢; Shell, 2.25¢ @ 2.50¢; and Foreign Steel Plates, 2.25¢ @ 2.4¢, for Tank; 2.45¢ @ 2.50¢ for Shell, and 2.75¢ for Flange and Fire-Box.

Steel Rails.—One of the makers reports sales during the week aggregating 6000 tons. Outside of this no transactions whatever are reported, and the market is extremely dull both East and West. As already stated, the chief interest lies now with developments in the West, where naturally the recent strikes have been practically paralyzing business with the roads of the Northwest. The Board of Control has decided upon an increase in the allotment of 200,000 tons, which will relieve the pressure on some of the Eastern mills. We continue to quote $31 @ $31.50 for Standard Sections at Eastern mill, with the West relatively lower.

Merchant Steel.—At the meeting at Pittsburgh referred to in our last issue the following prices were made:

	50-Ton lots.	carlots.	Less than carlots.
Machinery.....	2 2¢	2 2½¢	2.40¢
Tire.....	2.15¢	2.2½¢	2.35¢
Toe Calk.....	2.25¢	2.30¢	2.4 ¢
Sleigh Shoe.....	2.10¢	2.15¢	2.30¢

Terms, 60 days, with 2 % off for cash in 10 days. The market has been very dull of late.

Old Rails.—The New York market continues weak, with only few sales, among which is a lot reported by a consumer of 500 tons of Double Heads, free to barge, at a shade under $21. We quote Double Heads nominally $21.

Scrap.—The market is weak for both foreign and domestic, with few sales reported. Heavy piling Scrap has been offered at $19.50, subject to inspection, delivery free, and other grades have been offered as low as $19.

Track Material.—The market is weak with Spikes at 2.10¢ @ 2.15¢, delivered; Angle Bars, 1.7¢ @ 1.8¢; Bolts and Square Nuts, 2.7¢ @ 2.8¢, and Bolts and Hexagon Nuts, 2.9¢ @ 3¢. A contract for 24,000 Angle Bars for the New Jersey Central Railroad was taken by a Pennsylvania mill.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, PA., April 3, 1888.

The first quarter of 1888 closed with prices lower than they have been for nearly two years. The volume of business is still large, but the tendency toward lower prices does not appear to be exhausted. At the very low figures now current there may be a slight pause until some adjustments in cost have been made, but it is not by any means certain that bottom has been reached. Consumers either withhold bids for large lots entirely or name figures so far below the market that there is no chance for them being accepted at present; yet buyers seem to be very confident of their position, and unless on their own terms take no more than is actually necessary to cover immediate wants. The idea seems to be that cost must be pared down until a point is reached by which this section of country can hold its own against outside competition. This has not been the case for some time past, nor is it so now, although the adjustment is under way and may perhaps be facilitated by a little stiffening in quarters hitherto in opposition to this market. It is a hopeful feature that during the past two or three days firm offers for large lots have been made, but, as we said before, at prices too low to meet with immediate acceptance. But it indicates the probability of business from sources which have not been available for some time past, but for the present it is chiefly a question of prices.

Ores.—Best New Jersey Magnetics are quoted at $3.75 @ $4.25, f.o.b. cars, at shipping points. Mr. J. Wesley Pullman, of Philadelphia, sends out a circular stating that he will be able this week to quote Lake Superior Ores at a price delivered to any of the furnaces in the Schuylkill or Lehigh valleys.

Pig Iron.—It is a delicate matter to offer an opinion on the probable course of the Pig-Iron market, and no easy task to define its present condition. Generally speaking, it is dull and unsettled, but there is a scarcity of some brands and some grades; and, in fact, these are the brands and the grades with which consumers in this market are most familiar. Hence, in looking for what they especially want, they find comparative scarcity and firmness. Of brands and grades that are not wanted there are plenty; and as a natural consequence at irregular prices. How these anomalies will be adjusted time only can tell, but in view of the low prices at other points, and the shrinkage in values all through the list, there is an impression that a still lower level must be found before absolute confidence can be established. It is not more than three or four years since No. 1 Foundry sold at $18 at tide,

and Gray Forge at $15.50 @ $16, and not nearly so much grumbling among sellers as there is to-day. We are informed by one of the Lehigh companies that their cost to-day is from $3 to $3.50 ℔ ton more than it was in 1884. What was done then must be done again; otherwise the trade will be lost. The meeting of Lehigh Iron masters in Allentown last Thursday shows that they begin to realize the seriousness of their position; and the demand for better facilities and cheaper freight and materials has been made none too soon; and, as a matter of fact, if cost can be reduced to the lowest ever known, there will even then be plenty of competition, as some of the recently completed furnaces will not surrender the position they have acquired without a struggle. Prices are nominally $20 @ $21 for Standard to Choice No. 1 Foundry at tide; $18.50 @ $19 for No. 2, and about $17 for Gray Forge. There is some scarcity of good brands of Forge Irons, but there is a fair supply of irregular Irons at from $16 to $16.50, quality of which is more or less problematical; hence the difference in quotations. The immediate indications point to an increasing demand, but while prices are moderately steady, as above mentioned, there is a disposition among consumers to move with unusual caution.

Foreign Iron.—Absolutely nothing doing and prices are purely nominal, as last quoted—viz.: about $20 for Bessemer, c.i.f., duty paid, and $27 @ $27.50 for 20 % Spiegel.

Blooms.—Steel Blooms are in good demand, and mills are selling freely at about the rates quoted herewith. Foreign are held too high for this market, negotiations at lower figures having fallen through. Quotations about as follows: Foreign, at tide, c.i.f., duty paid, $30 @ $31 for Nail Slabs; $31.50 @ $32.50 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c. Domestic Blooms: Steel, from $30 to $35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, $53 @ $54; Run-out Anthracite, $45 @ $46; Scrap Blooms, $38 @ $39 ℔ "bloom" ton.

Muck Bars.—Demand very slow. Quotations almost nominal at $28.50 @ $29.50 at mill according to location, &c.

Bar Iron.—There is a fair average demand, but the heaviest portion of the business seems to be carried off by outsiders. The fact is that local mills cannot meet the prices made by their Western competitors, so that only the smaller class of orders are being filled in this market. This cannot continue for any length of time, however, as with cheaper fuel and other concessions which are likely to be made business will doubtless soon resume its usual course. Then, again, it is by no means sure that buyers are getting a quality that will prove satisfactory, but in any case efforts will be made to retain a fair share of the business properly belonging to the East. About 1.8¢ is talked of as a price at which large lots of both Bars and Skelp would be taken, but up to this time manufacturers have not been able to meet that figure, although buyers claim that it has been done for Western Iron. As a rule, 1.9¢ @ 1.95¢ is asked for really first-class Iron, but there is little doubt that concessions have been made to large buyers, and, as we said before, strong efforts will be made to adjust prices in proportion to those at other competing points.

Plate and Tank Iron.—The demand has been very moderate of late, and the mills have not been able to increase their engagements to any extent since date of our last report. Some fair sized orders are said to be offered on the basis of about 1.9¢ for Plates, but it will be difficult to place them at that figure, although buyers claim that they can do so by going a short distance from their usual source of supply. At quoted rates it seems impossible to do more than a small hand-to-mouth business, and it is not unlikely that concessions will be made in the hope of securing a larger line of work. Prices nominally about as follows: Ordinary Plate, 2¢ @ 2.10¢; Tank, 2.10¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.4¢ @ 2.5¢; Shell, 2.8¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—A moderate amount of business has been placed, leaving the mills with plenty of work for the present and prospects quite encouraging for the spring and summer months. Prices are still a little unsettled, but not likely to go much, if any, below current quotations, which are about as follows: 2.10¢ @ 2.20¢ for Bridge Plate; 2.15¢ @ 2.25¢ for Angles; 2.7¢ @ 2.8¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—Only a small business has been done, but the feeling is somewhat confident at the present low figures, and for the best makes prices for small lots are steady as follows:

Best Refined, Nos. 26, 27 and 28....	3½¢
Best Refined, Nos. 18 to 25	3¼
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28....4½ @	4¾¢
Best Bloom Sheets, Nos. 22 to 25....4 @	4¼¢
Best Bloom Sheets, Nos. 16 to 21....3½ @	3¾¢
Blue Annealed.....2.8 @	3 ¢
Best Bloom, Galvanized, discount.....60	%
Common discount..... ..65	%

Steel Rails.—The market is rather dull, but in this section the mills are fully employed either on Rails or on orders for other kinds of Steel. Prices for Rails are firm at from $31.50 to $32 at mill, and only the most desirable class of orders are taken into consideration at the inside figure. A moderate business is being done in small lots at about $32, with no indications of any immediate change from the present position of things.

Old Rails.—There is not much business to report, as such small lots as are available for spot delivery are held above the market. Buyers could probably be found for T's at about $20.75 @ $21. Lots to arrive are held at $21 @ $21.50, and spot lots at $22 and upward. Demand very light and prices unsettled.

Scrap Iron.—The market is feverish and irregular, with quotations about as follows: $20.50 @ $21 asked for No. 1, or $21.50 @ $22 for carload lots, or for choice $22.50 @ $23; No. 2 do., $14 @ $15; Turnings, $15 @ $16; Old Steel Rails, $20 @ $21; Cast Scrap, $16 @ $17; do. Borings, $11 @ $12; Old Fish Plates, $26 @ $27. Old Car-Wheels, $17.50 @ $18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—The condition of trade in this department remains about the same as last reported. Mills are well supplied with orders, but generally at prices that are close to or at actual cost of production. No sales of any moment are reported, small lots being the rule. Discounts are quoted as follows: Black Butt-Welded, 50 %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 50 %; Boiler Tubes, 60 %.

Nails.—The market shows some signs of firmness with an increasing inquiry. Stocks are very much reduced and production is being kept well under control. Price is quoted from $2 to $2.20, according to brand, delivery and quantity taken.

Chicago.

Office of *The Iron Age*, 15 and 97 Washington St., Chicago, April 2, 1888.

Business is being sadly demoralized by the railroad troubles. Merchants and manufacturers are becoming very impatient with the slim prospect in view of an early settlement, and their common prayer is that the railroad companies will precipitate a general contest over the questions at issue and bring matters to a speedy climax. There is nothing so vexatious as a constant recurrence of petty annoyances, and this has been the experience of Chicago business men for some time. They would hail with pleasure a week or two of absolute suspension of trade if at the end of that time transportation matters should be attended to with their old-time smoothness and promptness.

Pig Iron.—The opinion is quite generally advanced that if the railroad muddle was out of the way a good volume of business could be looked for. Just now, however, most buyers are purchasing very sparingly, carload lots being the rule. The prevalence of the hand-to-mouth policy has been very forcibly shown during the past week. Business was blocked on one or two railroads over which large supplies of Iron are received for this market, and within two days foundrymen were clamoring for stock and frantically urging early attention to their wants. The situation is so precarious that everybody is at sea and anxiously awaiting developments. Very little change is to be noted in prices, which are as follows, for cash, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $21 @ $22; Alabama Car-Wheel, $27; Southern Charcoal Foundry, No. 1, $20 @ $21; Jackson County Softeners, No. 1, $19.50 @ $20; Hocking Valley, Soft Foundry, No. 1, $19 @ $19.50; American Scotch, No. 1, $20 @ $20.50; Lake Superior Coke, No. 1, $18.50 @ $19; No. 2, $17.50 @ $18; No. 3, $16.50 @ $17; Southern Coke, No. 2, $18.50 @ $19; No. 2¼ and Open Bright, $18 @ $18.50; No. 3, $17.50 @ $18; No. 1 Mill, $17; No. 2 Mill, $16.50. The quotations for Southern Irons are nominal, as transactions are necessarily light with such prices asked, but agents state that at present other markets net the makers better results, so that they are not pushing sales here.

Bar Iron.—Very little seems to be needed at present, particularly by consumers who depend upon railroad patronage. Still, the market has an appearance of firmness, more mills than last week asking 1.75¢ for good Common Iron, half extras, in carload lots, f.o.b. Chicago. But some sellers are to be found at lower figures, 1.70¢ being shaded on very good specifications. Store prices continue to range from 1.90¢ to 2.20¢, according to quantity and quality.

Structural Iron.—The season is opening with very fair prospects for Beams and other building shapes. Fewer large undertakings are now in sight than in the last few years, but small work is reasonably plentiful. The demand is growing in the country also, orders coming in from small towns in which the use of Iron or Steel in building would not have been thought of but a short time since. Angles are held at 2.60¢, Tees at 3¢, and Beams and Channels, 3.80¢, all from store; Universal Plates, 2.40¢, f.o.b. Chicago, from mill.

Sheet Iron.—Manufacturers' agents report continued inquiry from large buyers, some of whom are purchasing when they find prices and terms to suit. Quotations for carload lots are 2.95¢ @ 3¢, f.o.b. Chicago, for No. 27 Common Black. Store prices are based on 3.35¢ for No. 27, with concessions to best buyers. Galvanized Iron is not in such heavy demand, owing to the railroad troubles, but prices show no change, small lots being quoted at 60 % off for Juniata, and 60 % and 5 % off for Charcoal.

Plates, Tubes, &c.—The demand is below that of last week but a good volume of business is reported for the season.

Transactions were largely in small lots with very few carload orders. The railroads are buying in very limited quantities. We quote from store as follows: Heavy Sheets, Nos. 10 to 14, 2.70¢; Tank Iron, 2.60¢ @ 2.70¢; Tank Steel, 2.75¢ @ 3¢; Shell Iron, 3¢; Shell Steel, 3¢ @ 3.25¢; Flange Iron and Steel, 4¢; Fire-Box, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 60 % @ 62½ % off on 2¼-inch and larger and 57½ % off on 2-inch and smaller.

Merchant Steel.—Business has been very quiet at the following rates from store: Bessemer Bars, 2.45¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—Orders have been taken by some of the local mills during the past week, but the quantities have not transpired. It has been definitely decided that the North Chicago Rolling Mill Company's Works will continue in operation, orders having been secured which will enable them to run for some time. There are other contracts under negotiation for quantities ranging from 10,000 to 15,000 tons, which will be settled within a few days. While the outlook is not specially encouraging, the condition of the trade is much more satisfactory in this vicinity than a month since. Prices are steadily maintained at $33 @ $34.

Old Rails and Wheels.—Transactions in Old Iron Rails are exceedingly light, as this material is becoming very scarce, and it is possible that but little will be done until the railroads begin to resume the repairing of their tracks. The largest consumers in this vicinity state that their views at present are about $20, and it is known that small quantities have been sold at this figure. There are parties, however, who are holding for $21 or more. No movement is reported in Car-Wheels, although they are in slight demand at $20.50.

Scrap.—The past week is the quietest that has been seen for a long time. Consumers are apparently waiting to see what will be the result of the railroad troubles. Dealers continue to offer $13 @ $14 for Mixed Country Scrap. Carefully selected is held as follows ℔ ton of 2000 lb: Railroad Shop or No. 1 Forge, $19.50 @ $20.50; Track, $18.50 @ $19; No. 1 Mill, $15 @ $16; Light Wrought, $9.50 @ $10.50; Machinery Cast, $15.50 @ $16; Stove Plate, $12.50 @ $13; Cast Borings, $10; Wrought Turnings, $12 @ $12.50; Axle Turnings, $13.50; Coil Steel, $14 @ $15; Leaf Steel, $15.50 @ $16; Locomotive Tires, $16.50 @ $17; Horse-shoes, $19.50@ $20; Axles, $25 @ $25.50.

General Hardware.—Jobbers report a considerable falling off in trade as compared with last week, which naturally results from the advance in railroad freight-rates. They are full of orders yet, but are not driven so much as they were. They state that the 24th ult. was the heaviest day in the Hardware trade that Chicago has ever seen. They look forward to a good business for the next 60 to 90 days, notwithstanding the unusually heavy demand that was forced during the last couple of weeks by low freight rates. There are no indications of an immediate change in prices, but it will not be surprising to see a fall in staple goods as a result of a sudden stoppage of the rush, which is anticipated. The demand for Wagon Stock and Heavy Hardware was unusually good during the week, the season for Wagon and Carriage building opening up in good style. Collections are still in excellent shape.

Nails.—Rumors of cutting of Steel Nail prices by manufacturers' agents which were reported last week are growing more pronounced. The Wheeling mills appear to be almost the only ones strictly maintaining the $2.15 rate, f.o.b. Chicago. Orders are not abundant, and it is not believed that the cut prices will induce heavy purchases at present, in view of the large quantities bought by the jobbers so recently. Jobbers continue to quote $2.25 for small lots, with 10¢. off on carloads. The demand for Wire Nails is quiet, but the manufacturers appear to be holding prices firm. Jobbers quote $2.75 for carloads and $2.85 for small lots.

Barb Wire.—The manufacturers have not caught up with their orders yet, and probably will not for some time, as their trade is holding up exceedingly well. Jobbers quote 3.25¢ for small lots of Painted, with $\frac{1}{10}$¢ off for carloads and ¾¢ advance for Galvanized.

Pig Lead.—The situation has changed but little from that reported last week. Quotations are steady at 4¾¢ @ 4.90¢ for carload lots, with but little inquiry from any source.

Messrs. Matthew Addy & Co., of Cincinnati, who are represented in Chicago by S. H. Fernandez, 115 Dearborn street, have been appointed sales agents for the Woodward Iron Company, of Woodward, Ala., manufacturers of Pig Iron. Their Iron is made from Brown Hematite, Blackband and Red Fossil Ores, and has a high reputation for strength and fluidity.

The Springfield Iron Company have appointed James Johnston their agent in Chicago, with office at 115 Dearborn street, to succeed B. L. Keen, who recently severed his connection to engage in other business. Mr. Johnston has been in the service of this company for several years, filling various positions. He was formerly a member of the firm of Bigelow & Johnston, of New York.

The Kelly Barb Wire Company have removed from 15 to 21 North Clinton street to 228 Lake street, Chicago.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, Pittsburgh, Pa., April 3, 1888.

There has been no important change in the general position of the Iron and Steel industries in this district during the past week; while in some respects the situation is still discouraging, in others it is looking up. The labor complications are the most serious trouble at present, and the tariff agitation comes next. The proposition made by Mr. Andrew Carnegie to his 3000 employees, at the Edgar Thomson Steel Raill mill, has not yet been accepted. So far as can be learned it does not strike the men very favorably, and the indications are that the strike is not so near the end as was hoped. The Edgar Thomson Works have been standing idle for over three months, and it is intimated that if the men refuse to accept the proposition in question the firm will then make no effort to start up the works before the 1st of July. The river coal trade continues in active condition. There has scarcely been a week this year but what large shipments have been made by river, and as a consequence the down-river markets where there was a coal famine last fall are now overstocked, and prices are down low. At Cincinnati Pittsburgh coal is only worth 6½¢ @ 7¢ ℔ bushel afloat. Coal is taken from here to Cincinnati, a distance of almost 500 miles, for less than 1¢ ℔ bushel.

Pig Iron.—There is no improvement to note in demand, which is still of a hand-to-mouth character, and there is not likely to be until there is a considerably improved trade in the products, as the start must be made in the latter. Not for a number of years has the market been in such an unsettled and unsatisfactory condition to furnacemen as at present. Some of them aver that in all their experience they never knew the business to be in a meaner condition than it is now and has been for several months past. In addition to a very limited demand, it is only the furnaces favorably located and having every advantage that can make both ends meet. While it is true that the price of Coke has been further reduced, it is also true that Pig Iron has further declined, and it is evident there will have to be a reduction in the cost of both Ore and labor, as well as freights. Some furnaces in the Mahoning Valley have obtained a reduction in the cost of furnace labor of 10 %, and it is not likely that any of the furnaces now standing idle will be started up until they can secure a reduction in the cost of both labor and Ore, and the railroads will be forced to do likewise. Furnacemen appear to be indifferent about making contracts for future delivery at present prices, which we quote as follows:

Neutral Gray Forge	$15 00 @	$15.75,	cash.
All Ore Mill	16.25 @	16.75	"
White and Mottled	15 00 @	15.25	"
No. 1 Foundry	17.50 @	18.00	"
No. 2 Foundry	16.50 @	17.00	"
No. 3 Foundry	16.00 @	16.25	"
Charcoal Foundry	22.00 @	24.00	"
Cold Blast Charcoal	26.00 @	30.00	"
Bessemer Iron	17.50 @	17.75	"

So far as we can learn, there have been no sales of good brands of Bessemer under $17 50, cash, and some furnacemen are reported as being indifferent about making sales, even at that price.

Muck Bar.—There is a little more inquiry, but no improvement in price, and not likely to be as long as the raw article continues on the down grade. We continue to quote at $27, cash, at which sales of some 2000 tons are reported. It is intimated that sales have been made from 25¢ to 50¢ per ton below the price quoted, but so far as your correspondent here knows, $27, cash, is the lowest price at which sales of good strong Neutral have been made.

Manufactured Iron.—The general Merchant Iron trade continues slow for the season, and prices are weak, in sympathy with the raw article. Bars are quoted at 1.80¢ @ 1.85¢; Plates, 2.30¢ @ 2.35¢, and No. 24 Sheet, 2.75¢ @ 2.80¢, all 60 days, 2 % off for cash. These quotations are for first quality Iron; poorer grades one to two tenths less than prices quoted. There is an improved demand for Pipe Iron, and the indications are that it will be still better as the season becomes more advanced. One mill here reports having all it can do on Pipe Iron, but a good many of the mills are short of business.

Nails.—Trade continues light for the season, and while it is hoped that it will improve later on, the outlook is not as encouraging as it might be. There are but three firms here attempting to do anything in this line—viz.: Chess, Cook & Co., Jones & Laughlins, and Shoenberger & Co., and they, so far as we can learn, are running but little more than half time. No change in prices, $1.10, 60 days, 2 % off for cash in carlots and upward, and 10¢ ℔ keg additional for less than a carload.

Wrought-Iron Pipe.—The outlook is a little brighter for business, but prices continue unsettled and unsatisfactory, each firm being free to make their own prices. The placing of an order by the Standard Oil Company for 200 miles of 8-Inch Pipe has infused a little more life into the Pipe business, but it is said to have been at an exceedingly low price. The Pennsylvania and National Tube Works, of this place, got some of the orders in question. The former is said to have secured 75 miles of it. A Reading mill and the Allison firm, of Philadelphia, also got some of it. It is expected that some other good-sized or-

ders will be placed before long, as some of the natural gas companies will want to resume the work of putting down pipe early next month, if not before. In this city they are not allowed to tear up the street before May 1. Discounts on Black Butt-Welded Pipe may be quoted at 50 %, on Black Lap-Welded 65 %, Casing, all sizes, and Boiler Tubes 60 % off.

Old Rails.—There has been less business reported the past week, and while the market is dull and weak prices remain about as last quoted, $23 @ $23.50 for American Tees. There was a sale of 500 tons closed on last Saturday at $23.25 for delivery at Youngstown, Ohio. Foreign Rails connot be laid down here from the seaboard at prices quoted, and this explains why there have been no sales of the atter made in this district for some time last.

Steel Rails.—There have been no sales reported here for some sime, in the absence of which we continue to quote nominally at $31.50 @ $32, cash, at mill. The Edgar Thomson Works are still standing idle, with but little prospect of their being started up soon.

Billets, &c.—Bessemer Steel Billets are weaker, and we now quote at $29, cash, with intimations that they can be bought at $28.50, although makers generally are stiff at $29. Domestic Rail Ends may be quoted at $18 @ $18.25, and Bloom Ends at 25¢ @ 50¢ per ton less.

Railway Track Supplies.—There is more doing, but business continues light for the season, while prices remain unchanged. Spikes, 2.25¢, 30 days, delivered; Splice-Bars, 1.85¢ @ 1.90¢; Track Bolts, 2.90¢ with square and 3¢ with hexagon nuts.

Old Material.—There is a fair demand for No. 1 Wrought Scrap at $20, net ton; Wrought Turnings, $13 @ $13.50; Car Axles, $25; Cast Borings, $11.50 @ $12.50 gross; Cast Scrap, $16.50 @ $17. There have been no sales here recently of Old Wheels, and there appears to be no demand for them.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 2, 1888.

Pig Iron.—Business in Pig Iron in the immediate vicinity of Cincinnati during the week under review has been without animation. Some few contracts for moderate amounts are said to have been closed, but the greater part of the transactions have been for small amounts for immediate use. Weakness continues to be a prominent feature throughout the market, and, apparently, there is plenty of Iron obtainable at the declining prices. Mill grades continue especially heavy. No. 2 and off grades, more largely Foundry grades and Car-Wheel Iron, for especial reasons, continue relatively firm, but the whole market is not free from a depressed feeling, notwithstanding the potent influences which are cited as favoring a recovery. The reduction in the production of Pig Iron by the blowing out and banking up of furnaces in various sections is estimated to be equal to about 25 % of total production since January 1. This is to some extent offset by the product of new furnaces in the South. Business in produce lines in this section has been small recently, and there has been a lack of vitality in many branches of industry which are direct or indirect features of the Iron trade. The money market here has continued unusually close. Pork-packers, who are large borrowers during the winter packing season, usually at this season liquidate their debts, but this year they have been unable to do so by reason of unfavorable transportation rates, depreciation of stocks on hand, &c. To these facts is due in large measure the closeness of money here, but the payment of the 100 % dividend to depositors of the Metropolitan bank by the receiver will make about $500,000 available on April 16, and with tax listing over, an easier money market may be anticipated, which will doubtless have a stimulating effect upon general business here. The Cincinnati Centennial Exposition Buildings were dedicated here last Saturday. Prices current here for Pig and Manufactured Iron, for cash, f.o.b., are revised as follows:

Hot-Blast Foundry.	
Southern Coke, No. 1	$19.00 @ $19.50
Southern Coke, No. 2	17.50 @ 18.00
Southern Coke, No. 3	16.75 @ 17.50
Ohio Soft Stone Coal, No. 1	18.50 @ 19.50
Ohio Soft Stone Coal, No. 2	17.50 @ 18.00
Mahoning and Shenango Valley	19.00 @ 20.00
Hanging Rock Charcoal, No. 1	22.00 @ 23.00
Hanging Rock Charcoal, No. 2	21.00 @ 23.00
Tennessee and Alabama Charcoal, No. 1	19.50 @ 20.00
Tennessee and Alabama Charcoal, No 2	18.50 @ 19.50
Forge.	
Strong Neutral Coke	16.00 @ 16.50
Mottled Neutral Coke	14.00 @ 15.00
No. 1 Mill Coke	15.00 @ 16.50
No. 2 Mill Coke	14.50 @ 15.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	22.50 @ 24.00
Hanging Rock, Cold Blast	24.00 @ 25.00
Lake Superior Car-Wheel and Malleable	22.00 @ 23.00

Old Rails and Wheels.—There has been an inquiry for Old Rails, but the offerings have continued small and prices nominal at $20.50 @ $21 ℔ ton. There have been small sales of Old Wheels at $20 @ $20.50 ℔ ton.

Nails—Have continued steady with a air jobbing trade, 10 @ 60d selling at $2.10 ℔ keg, and other sizes at proportionate rates. Steel sell at $2.15 and Steel Wire at $2.90 ℔ keg.

Manufactured Iron.—There has been a lack of animation during the week, and prices of all kinds have been barely sustained. Bar and Sheet Iron—Common Bar Iron, 1.90¢ @ 2¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, boiled, Nos. 10 to 27, 2. 50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, TENN., April 2, 1888.

The situation, so far as general business is concerned, seems to keep pace with the advance of spring, and business men appear to be satisfied with the situation. Among manufacturers of building material there is great activity, and their works have been run to their full capacity. The same condition of affairs applies to the lumbermen who are now reaping their harvest, the recent floods bringing to this market many million feet of logs. The demand for our mill products has steadily grown to what may be said to be a very important feature of our staple article of commerce, and this point is now a basis from which many millions are annually distributed to every point of importance in the United States. The general Hardware trade is also in a very satisfactory condition, and merchants are having about all they care to do. There has been some improvement in railroad facilities for shipping, and there seems now to be but little complaint upon the subject of detention of goods, although there is yet room to utilize a large amount of rolling stock if the lines saw proper to get it.

Pig Iron.—The improvement in the situation reported last week has fully held its own, and there is a better feeling among the producers. It appears to be generally conceded that the bottom has been reached, and judging from inquiries and some sales there is a prospect of a little stiffening up of prices, especially of the best grades of favorite brands, which are positively scarce, and it is perfectly safe to say that every ton of Iron that holds strictly up to quality that the Southern furnaces could turn out during the next six months could be placed at the prices that are now ruling. During the confusion that prevailed some days ago a good deal of Iron was sold at low figures, and low grades were shipped on such orders, but in many instances the transaction resulted in great dissatisfaction and difficulty in settlement and a reaction in the feelings of consumers upon the subject of buying cheap Iron. One large foundry stated that one carload of such Iron cost them more than $500, being obliged to throw away most of the work and return it to the Scrap pile. With the exception of inferior Irons none of the furnaces are accumulating stocks worthy of mention, and "spot" Iron is commanding good prices and speedy sales. The policy that has been pursued in times gone by by the furnaces in making large contracts for deliveries in the far-off future does not seem to be so popular now, and many of them are holding their output well in hand and depending upon daily consumption for their market. Two of the new furnaces and two that have been under repairs will go in during the present month, which, of course, will add that much to the output; still there is no apprehension but that it will all be taken care of.

Cleveland.

CLEVELAND, April 2, 1888.

Iron Ore.—Until the railways enter the market with substantial orders for Steel Rails the furnacemen will not push their inquiries for Ore. The navigation season will undoubtedly open before a single season charter for bringing down Lake Superior Ore shall have been made. The experiment of making single trip engagements will probably be tried. Not a ton of new Ore has yet been sold. A week ago it seemed probable that sales would be made by April 1, but the encouraging features then noticed have disappeared. Some of last year's Ore on the dock is being disposed of at $7 for No. 1 Specular and Magnetic Bessemers, and $6 for Bessemer Hematites. Furnacemen have been heard to express regret that the condition of the market did not warrant generous purchases of Coke at the present rates.

Pig Iron.—The market retains all the elements of inactivity and dullness noticed last week. It is impossible to learn of any substantial sales. But for the order from the car-building works the demand for Pig Iron of any kind would amount to nothing. The concessions hoped for from the railway companies have not been made, and there seems little prospect for lower freights. Following are f.o.b. cash quotations in this market.

Nos. 1 to 6 Lake Superior Charcoal	$21.50 @ $22.00
No. 1 Strong Foundry, Bessemer quality, ℔ ton	18.50 @ 19.00
No 1 Strong Foundry, ℔ ton	17.50 @ 18.50
No 2 Strong Foundry, ℔ ton	16.50 @ 17.50
No. 1 American Scotch, ℔ ton	18.35 @ 19.35
No. 2 American Scotch, ℔ ton	17.35 @ 18.35
No Soft Silvery, ℔ ton	18.50 @ 19.50
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	16.00 @ 16.25
Mahoning and Shenango Valley Red and Short Mills, per ton	16.50 @ 16.85

Manufactured Iron.—The market is much more active than for two or three months past, and the volume of business is quite large. Common Bar at 1.70¢ has sold freely.

Sheet Iron.—The market is firmer. No. 24 Galvanized at $2.70 forms a basis for quotations in other grades.

Nails.—Steel Wire Nails fell to $2.70 at the close of last week. Common Iron Nails are quoted from store at $2 ℔ keg.

Old Rails.—A few hundred tons of Old Americans were purchased during the past five days at $22.25. There is no demand for Car-Wheels.

Detroit.

WILLIAM F. JARVIS & Co., Pig-Iron merchants, Detroit, report as follows under date of April 2d: The past week has shown quite an increase in the number of orders over the previous one, and, with the exception of prices, business has been quite satisfactory. Inquiries for Charcoal Iron are in the majority, and some orders for future delivery have been booked. The feeling that hard-pan has at last been struck seems to be growing, and some of the large buyers are now willing to contract for several months ahead. The announcement by the Thomas Iron Company of prices for the year goes to show that they also consider bottom has finally been reached. The demoralization of the Coke pool may for the present benefit some furnacemen, but the low price of Coke will probably necessitate a reduction in labor, and this may cause another Coke strike, and, if it occurs, manufacturers will lose a great deal more than they will have gained by the reduction. We quote, f.o.b. Detroit, as follows:

Lake Superior Charcoal, all numbers	$21.00 @ $21.50
Lake Superior Coke, All Ore	20.50 @ 21.00
Lake Superior Coke, Cinder Mixed	19.00 @ 20.00
Standard Ohio Blackband	21 00 @ 21.50
Southern No. 2	19 00 @ 19.75
Southern Silvery	18.50 @ 19.00
Jackson County, Ohio, Silvery	20.50 @ 21.00
American Old Iron Rails	24.00 @ 26.00
Old Wheels	21.50 @ 22.00

Louisville.

LOUISVILLE, KY., April 2, 1888.

The market has been quiet, as most buyers have made purchases that will answer their wants for the next two months; and, as the buying still continues from hand to mouth, purchasers don't desire to contract for deliveries extending over three months. Old Wheels and Rails are in fair demand, but in many instances purchasers of Wheels have not been able to fill their wants.

Southern Coke, No. 1 Foundry	$18.25 @ $19.25
" No. 2 "	17.25 @ 18.25
" No. 2½ "	16 75 @ 17.75
Hanging Rock, Coke, No. 1 Foundry	18.75 @ 19.75
Hanging Rock, Charcoal, No. 1 Foundry	22 25 @ 23.75
Southern Charcoal, No. 1 Foundry	19.25 @ 21.25
Silver Gray, different grades	15.75 @ 16.75
Southern Coke, No. 1 Mill, Neutral	15.75 @ 16.75
" No. 2 " "	15.25 @ 16.25
" No. 1 " Cold Short	15.25 @ 16.25
White and Mottled different grades	14.75 @ 15.75
Southern Car-Wheel, standard brands	22.75 @ 23.75
Southern Car-Wheel other brands	19.75 @ 21.75
Hanging Rock, Cold Blast	22.75 @ 24 75
Hanging Rock, Warm Blast	19.75 @ 20.75

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	$0.10 @ $0 12
Light Copper	.09
Copper Bottoms	.09
Brass, Heavy	.08½
Brass, Light	.06½
Composition	.12 @ .12
Lead, Heavy	.03¾ @ .04½
Tea Lead	.04
Zinc	.03 @ .03¼
Wrought Iron	ton, 18.00 @
Light Iron	ton 10.00 @
Stove Plate Iron	ton, 10.00 @
Machinery Iron	ton, 13.00 @ 13.50
Grate Bars	ton @ 7.00
Old Rubber	lb. .04½ @ .4 5½
White No. 1	lb. .03⅞ @ .03¾
White No. 2	lb. .01⅞ @ .01¾
Canvas, Linen, No. 1	lb. .04 @ .04½
Canvas, Cotton, No. 1	lb. .04¾ @ .04⅝
Canvas, No. 2	lb. .02¾ @ .02⅞
Seconds	lb. .01 @ .01½
Soft Woolens	lb. .06½ @ .07
Mixed Rags	lb. .01 @ .01⅛
Gunny Bagging, No. 1	lb. .02⅛ @ .02¼
Jute Butts	lb. .02½ @ .02⅝
Book Stock	lb. .01 @ .01⅛
Newspapers	lb. .00¾ @ .01
Waste Paper	lb. .00½ @ .00⅝
Hemp Twine	lb. .02½ @ .03
Sisil Baling Rope	lb. .... @ .03

Metal Market.

Copper.—After the holidays Chili Bars reopened in London at the same figures at which they had closed a week ago—£80 spot, and £79. 15/ futures. In our own market 200,000 lb were sold on Thursday at 15.95¢ for April, and at 16¢ for May; on Saturday, 150,000 lb May at 16¢; on Monday, 300,000 lb at 16¢ for May, June and July, since when there was a slight stiffening. Rio Tinto shares advanced in Paris 5¼ francs last Saturday. The *Diario de Barcelona* publishes an elaborate article on open-air calcination at Huelva, signed Siloins thos y Codina, and headed "Los Humos de Huelva," in which that gentleman tries to demonstrate that open-air roasting has done no harm, while the Copper-mining industry has benefited the entire region since the Government sold the mines, in an extraordinary manner. The mines are paying 2,000,000 pesetas, or francs, taxes to the Government, on a capital of 300,000,000 pesetas, per annum, while all other annual taxes do not exceed 450,000 pesetas on a value of 50,000,000 pesetas. Vital statistics are favorable. The region has been exempt from the cholera epidemics, which visited Seville, the nearest large city, and when raging there roasting of pyrites was even recommended for the time being to get rid of that plague. The population of the Copper district has doubled, the calcination smoke not increasing mortality in the least. Agricultural property has increased in value 40 per cent. since 1876, in spite of the smoke. On making the sale of the mines the contract stipulated that open air roasting was to be allowed, hence Señor Thos thinks that the Government will expose itself to suits for damages should its decree—of which we gave the details recently—be carried out on January 1, 1889. During a part of the week the Easter holidays caused a cessation of business in London, the market opening there on Tuesday practically unchanged. Here values have been steady, but the market has been dull. Prices are lower here than they are in England. The parity of Best Selected at £80 less 2½ % is 16.92¢. For shipment to England at that price would bring 16.55¢, allowing 10/ for freight, 5/ for insurance and 10/ commission ℔ ton. To France, it would net 16.41¢, allowing ¼¢ for freight, and the same figures for insurance and commission. There is some talk of a pool sale to American consumers and that may propably be looked forward to as the most important event in the near future. Officials of the Calumet and Hecla report that the fire is now evidently out, and that the mine will be opened in a few days, certainly before the 15th of this month. The market closes dull but steady at 16¢ for Lake, while 15¾¢ is asked for Arizona. We print elsewhere an interesting series of letters from Copper manufacturers on the situation.

Tin.—This metal has continued weak for the greater part of the week under review, with only a moderate business transacted. We quote at the close 35.50¢ bid and 36.25¢ asked for spot; April, 30.70¢ @ 30.90¢; May, 29.10¢ bid and 29.95¢ asked, and June, 27.75¢ bid and 28.25¢ asked. *Tin Plates.*—Trade is exceedingly dull. Even Coke Plates, which heretofore were moderately active, are now quiet, and but little business is doing in Ternes. Stocks in all lines are light, but especially so in Cokes. As there is no demand prices naturally exhibit a weakening tendency. Many mills are closed in Wales on account of the high price of Tin. It is suggested that had the works been well supplied with orders during the early part of the winter they might have laid in supplies of future Tin, which all along has been selling considerably below spot, and thus have been in a position to continue running. As it is, the present high price of spot Tin renders it impossible to make Plates at a profit. We repeat last week's quotations for large lots of Tin Plates in New York as follows: Siemens-Martin Steel, Charcoal finish, $5.10 @ $5.30; ditto, Coke finish, $4.90 @ $5; Ternes, $4.20 @ $4.30; Bessemer Coke, $4.75 @ $4.80, and Wasters, $4.62½.

Lead.—Business has been restricted to speculation on the exchange, the events of the past few days developing the fact that some of the speculators were unable to put up their margins. In the open market domestic Lead was offered on Tuesday at 4.90¢ without finding a buyer among consumers, and at the close the market is weak and lifeless, with no demand from manufacturers. The latter, corroders and pipemen, both complain that the consumption has fallen off, and are strongly disinclined to give any aid to the speculative movement. Mr. C. Kirkhoff, Jr., agent of the United States Geological Survey, reports the output of 1887 in net tons as follows:

	1885.	1886.	1887.
Desilverized Lead	107,437	114,829	135,552
Non-Argentiferous Lead	21,975	20,800	25,148
Total	129,412	135,629	160,700

Spelter.—The market is weak and du at 4.90¢ @ 5¢ for Common Domestic. According to the official report of C. Kirchhoff, Jr., agent of the United States Geological Survey, the production of Spelter in the United States was as follows, in net tons of 2000 pounds.

	1885.	1886.	1887.
Illinois	19,427	21,077	22,279
Kansas	8,502	8,932	11,955
Missouri	4,677	5,870	8,660
Eastern and Southern States	8,082	6,762	7,446
Total	40,688	42,641	50,340

The increase has chiefly been in Kansas, Missouri and the South.

New York Metal Exchange.

The following sales are reported:

THURSDAY, March 29.

100,000 lb Copper, May	16.00¢
25,000 lb Copper, April	15.95¢
50,000 lb Copper, May	16.00¢
10 tons Tin, April	31.00¢
10 tons Tin, May	29.40¢
25,000 lb Copper, April	15.95¢

FRIDAY, March 30.

275,000 lb Copper, April	16.00¢
175,000 lb Copper, April	16.00¢
25,000 lb Copper, June	16.00¢
100,000 lb Copper, May	16.00¢
48 tons Lead, April	5.10¢
200 tons Lead, May	5.10¢
10 tons Tin, April	30.95¢
48 tons Lead, April	5.12½¢
242 tons Lead, May	5.10¢
16 tons Lead, April	5.10¢

SATURDAY, March 31.

100,000 lb Copper, May	16.00¢
48 tons Lead, April	5.10¢
50,000 lb Copper, May	16.00¢

MONDAY, April 2.

16 tons Lead, April	5.05¢
100,000 lb Copper, June	16.00¢
30 tons Tin, April	31.85¢
10 tons Tin, April	30.75¢
10 tons Tin, May	29.30¢
100,000 lb Copper, July	16.00¢
100,000 lb Copper, May	16.00¢

TUESDAY, April 3.

25,000 lb Copper, June	16.10¢
16 tons Lead, spot	5.00¢
32 tons Lead, April	5.02½¢
16 tons Lead, May	5.17½¢
10 tons Tin, April	30.85¢
10 tons Tin, April	30.80¢
25,000 lb Copper, June	16.05¢

WEDNESDAY, April 4.

25,000 lb Lake Copper, spot	16.00¢
25,000 lb Lake Copper, June	16.05¢
150,000 lb Lake Copper, April	16.05¢
200,000 lb Lake Copper, spot	16.05¢
10 tons Tin, April	30.80¢
10 tons Tin, April	30.75¢
10 tons Tin, May	29.40¢
80 tons Lead, April	5.00¢
200 tons Lead, May	5.02½¢

At the annual meeting, held April 2, the following officers were elected: President, Tallmadge Delafield; vice-president,

Wm. H. Davol; treasurer, Carl Mayer; secretary, Edward J. Shriver; managers, S. A. Jennings, B. Hochschild, Geo. E. Moore, M. B. Smith, S. Raunheim, E. P. White, D. Houston, W. I. Russell, L. Lewisohn, S. Mendel, A. Bennett, Jos. Byrne, R. M. Thompson, Geo. W. Jaques; Arbitration Committee, E. A. Caswell, Lucius Hart, Chas. S. Benton, F. Steiner, T. I. Crane.

Coal Market.

The Anthracite trade is less active than expected and hardly as strong. Individuals are said to be shading in some instances. It is reported from Philadelphia that the estimated output of Anthracite for April is 2,600,000 tons, against 2,786,796 tons for April, 1887, and it is supposed that while these figures are flexible an endeavor will be made to adhere to the estimate as closely as possible.

The Anthracite Coal production for the week shows greater activity at the mines, the total being 787,028 tons, which is an increase of 100,131 tons compared with the week ended March 24, making the aggregate since January 1 7,754,958, against 7,980,929, showing that the deficiency caused by strikes has been made good, all but 225,971 tons. Of the product last week Wyoming contributed 466,518 tons, an increase of 36,000 over the previous week. Schuylkill, 183,000 tons; increase, 43,000. Lehigh, 137,510; increase, 21,108 tons.

The Pennsylvania Railroad carried during the week 228,000 tons of Coal, and since January 1 2,681,343 tons, against 2,377,302 for the same time last year. The Reading carried 160,000 tons last week, of which 64,000 went to Port Richmond and Elizabethport.

The Bituminous trade is quiet. In the Clearfield district a movement is making to secure an adjustment of wages on a nine-hour basis, no miner to take out more that 5 tons of coal a day, thus indicating a surplus of labor in that region. Cumberland shipments last week comprised 66,291 tons, and for the year 730,570 tons, an increase of 46,220 tons as compared with the corresponding period of 1887.

The Reading Railroad Company, since January, have contracted in Harrisburg for 500 eight-wheel gondola cars, which have been adopted as the standard Coal car to replace the old four-wheeled eight and twelve ton cars as they beccme unfitted for service. In addition 60 new Consolidated freight locomotives have been ordered. Navigation on the Delaware and Hudson Canal opened on the 23d inst.—nine days earlier than last year, when the season was unusually backward. The indications are that the canal will do a larger Coal-carrying trade this year than ever before. As an indication of prosperous times, it is stated that the hundred or more boats on the Delaware and Hudson Canal laid off two years ago on account of a slackness in freights, in addition to the present large fleet of boats, have been ordered to commence running for the entire season. The company open the present season with over 300,000 tons at Honesdale awaiting shipment.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from March 23 to March 30, inclusive, and from January 1 to March 30, inclusive, were as follows:

Iron and Steel.

	March 23 to March 30. Tons.	Jan. 1 to March 30. Tons.
Iron Ore: Naylor & Co	362	4,242
Pig Iron: G. W. Stetson & Co	1,250	5,430
Crocker Bros	200	2,900
Jas. Williamson & Co	200	1,800
N. S. Bartlett	200	1,700
Spiegeleisen: J. A. Jansen	350	8,822
Naylor & Co	160	980
Steel: Naylor & Co	116	116
M. Cohn & Co	60	136
W. F. Wagner	40	371
R. H. Wolff & Co	33	178
J. Abbott & Co	27	348
F. S. Pilditch	11	88
G. A. Walschid	5	10
Newton & S	4	50
C. Hugill	3	70
C. W. Power	2½	18½
Steel Rods: J. Abbott & Co	428	1,953
Hy. Whittemore & Co	400	1,400
A. Heyn	208	769
Dana & Co	200	505
Naylor & Co	435	4,427
S. A. Galpin	35	1,139
Cary & Moen	25	315
Steel Sheets: Pierson & Co	40	276
Ogden & Wallace	25	57
D. J. Cooney	20	20
Lalance & G. Mfg. Company	20	162
Naylor & Co	13	183
Steel Forgings: Thos. Prosser & Co	135	1,314
Steel Plates: R. Crooks & Co	30	30
Hondolette & D	12	69
Steel Tubes: Thos. Prosser & Son	3	3
Steel Hoops: A. R. Whitney & Co	200	1,330
Steel Bars: Union Bridge Co	143	212
Naylor & Co	139	332
A. Milne & Co	100	185
Scrap Steel: Naylor & Co	66	66
Rivet Rods: A. Milne & Co	100	170
J. Abbott & Co	10	391
Wire Rods: Cary & Moen	10	23
Screw Rods: American Screw Company	70	302
Steel Iron: T. B. Coddington & Co	98	417
A. R. Whitney & Co	5	5
Charcoal Iron: J. Abbott & Co	22	22
A. Milne & Co	15	15
Boiler Tubes: W. H. Wallace & Co	14	38
Zinc Sheets: Naylor & Co	25	25
Old Iron Rails: W. H. Walbaum & Co	300	300

Tin Plates.

	Boxes.	Boxes.
A. A. Thomsen & Co	5,628	39,423
N. L. Cort & Co	2,565	27,633
T. B. Coddington & Co	2,489	37,584
D. Van Dusen & Co	8,840	65 345
Bruce & Cook	3,178	17,915
Jas. Byrne & Son	1,990	10,723
Central Stamping Company	1,699	5,454
R. Crooks & Co	1,577	17,617
Pratt Mfg. Company	1,543	39,402
Phelps, Dodge & Co	1,517	101,756
Wolff & Reesing	1,370	5,804
Naylor & Co	1,037	21,369
H. R. DeMilt & Co	1,037	3,090
Merchant & Co	356	2,411
C. S. Mersick	149	2,080

Metals.

	Pounds.	Pounds.
Tin: Muller, Schall & Co	559,672	582,058
J. Abbott & Co	353,513	5 025,337
Phelps, Dodge & Co	224,170	711,014
American Metal Company	14,713	508,836
Lehmaier Bros	14,933	14,933
Naylor & Co	14,713	508,836
Spelter: F. Osgood	83 887	83 887
	Casks.	Casks.
Antimony: Phelps, Dodge & Co.	50	900

Hardware, Machinery, &c.

Boker, Hermann & Co., Steel Pipes, bdls., 42; Hdw., cs., 25; Nails, cs., 7; Arms, cs., 19; Ironware, cs., 9; Chains, cs., 20; Mdse., cs., 19
Clark, G. A. & Bro., Mach'y, cs., 87
Castle, S. A. & Co., Iron Buckles, cs., 34
Field, Alfred & Co., Mdse., cs., 9; Arms, cs., 5; Hdw., cks., 3; Anvils, 159
Hartley & Graham, Mdse., 60
Hensel, Buckmann & Co., Mch'y, cs., 4; Mdse., cs., 7
Heyn, Alfred, Fence Rails, bdls., 7031
McCoy & Sanders, Chains, cks., 16
Montgomery & Co., Hdw., cks., 3
Oastler, W. E., Mach'y, pgs., 12
Scholback & Co., Hdw., pgs., 44
Schoverling, Daly & Gales, Arms, cs., 20; Mdse., cs., 19
Sheldon, G. W. & Co., Mach'y, pgs., 8
Taylor, Thos., Mdse., cs., 5
Thomas, D. & Co., Mach'y, cs., 2
Vom Cleff & Co., Hdw., cs., 11
Wardlaw, H. S., Engines, cs., 2
Wiebusch & Hilger, Lim., Mdse., cs., 10; Hdw. and Cutlery, cs., 3
Waefaeler, L., Nails, kegs, 73
Witte, John G. & Bro., Cutlery, cs., 34
Order: Mach'y, cs., 3

Exports of Metals.

	March 23 to March 30. Pounds.	Jan. 1 to March 30. Pounds.
Copper: J. Abbott & Co		3,602,859
Lewisohn Bros	157,078	2,893,539
F. A. Lomal		2,581,293
American Metal Co	629,500	2,354,787
G. H. Nichols		111,116
J. Bruce Ismay		112,000
S. Mendel		560,000
Ledoux & Co		2,100
Phelps, Dodge & Co		230 664
Muller, Schall & Co	205,000	430,000
Copper Queen Con. M. Co		224,034
J. Kennedy, Tod & Co		112,026
H. Becker & Co		1,250
Orford C. & S. Rfg. Co		224,881
Robt. M. Thompson		125,000
Thos. J. Pope, Sons & Co	312,500	543,850
J. Parsons & Co		67,500
Bridgeport Copper Co		112,000
Copper Matte: Williams & Terhune	1,717,907	15,617,365
Lewisohn Bros		2,746,780
American Metal Company		519,485
J. Abbott & Co		295,000
C. Ledoux & Co		386,520
F. W. J. Hurst		184,288
G. H. Nichols	328,959	328,959
Old Brass: Borgass & Co	29,014	82,514
Old Copper: Kunhardt & Co	30,802	30,802

Oils and Sundries.

Oils.

Bleached Whale, ℔ gal. 42 @ 45¢
Bleached Sperm, ℔ gal 68 @ 75¢
Fish Oil, Pressed 31¢
Lard, Prime, present make 62 @ 63¢
Cylinder Oil 70¢
Machinery 45¢
Engine 55¢
Linseed, Raw, in casks and bbls 56 @ 60¢
Linseed, Boiled, in casks and bbls 60 @ 64¢
Neatsfoot 45 @ 65¢
Cotton Seed, Refined 39 @ 42¢

Sundries.

Asphaltum, Cuban, ℔ ℔ 5½ @ 6½¢
Asphaltum, Egyptian 8 @ 9½¢
Benzine, 62°, ℔ gal 8½ @ 9½¢
Coal Tar ℔ bbl., $3.00 and $4.00
Chalk, ℔ 100 ℔ 45¢
Chalk, Block 3½¢
Crucibles, No 14 and upward, ℔ number 3½¢
Grain Emery, 300 ℔ kegs 4 @ 4½¢
Flour Emery, finest quality 2½ @ 2¾¢
Glue, White 18 @ 35¢
Glue, Sheet 13 @ 20¢
Glaziers' Points, Zinc, ℔ box $4.75
Gum, Copal 36¢
Gum, Damar 25¢
Gum, Shellac, English 30¢
Gum, Shellac, English, dark 25¢
Mineral Wool, ordinary, ℔ ℔ 1 @ 1¼¢
Mineral Wool, extra 3 @ 3½¢
Naphtha, 70° 9 @ 10¢
Naphtha, 76° 9½ @ 10½¢
Pumice Stone, selected lumps 5 @ 6¢
Pumice Stone, powdered 2 @ 2½¢
Pine Tar, bbls $1.95
Pitch $1.25
Plumbago, E. I. Po., ℔ ℔ 4 @ 6¢
Plumbago, American, ℔ ℔ 6 @ 10¢
Plumbago, Gun Powder Glazing, ℔ ℔ 10¢
Plumbago, Shot Polish, ℔ ℔ 10¢
Putty, in bladders 2½¢
Putty, in bulk 1¾ @ 2¢
Rosin, Strained and Good $1.47½ @ $1.50
Rosin, E. & F $1.52½ @ $1.55
Rosin, G. & H $1.65 @ $1.70
Rosin, I. & K $1.70 @ $1.90
Rosin, M. & N $2 05 @ $2.35
Spirits Turpentine, ℔ bbl 39½ @ 43¢
Stove Polish, Dixon's ℔ gross, $6.00
Stove Polish, Rising Sun 5.50
Stove Polish, Gem 4.50
Stove Polish, Jet Black 3.50
Waste, No. 1 Cop 8¾¢
Waste, No. 1 White Machine 8¾¢
Waste, No. 2 White Machine 8¼¢
Waste, No. 1 Colored 6¼¢
Waste, No. 2 Colored 5¾¢
Waste, Washed Machine 8½¢
Whiting, Spanish, ℔ 100 ℔ 50¢

Our Pittsburgh correspondent telegraphs: H. W. Hartman, chairman of the Hartman Steel Company, Limited, of Beaver Falls, Pa., has disposed of his interest in that company to Andrew Carnegie and retired. Mr. Hartman's plans for the future are not known. It is said that he will sail for Europe in a short time in search of much-needed rest.

The Chickies Iron Company have increased their capital stock $50,000, the entire amount having been taken by the present stockholders. The company will at once enlarge and improve No. 2 furnace to correspond with No. 1, which was changed in 1886, and has been in successful operation ever since. The contract has been given to the I. P. Morris Company, of Philadelphia, for the blowing engine, which will be 50 per cent. larger than that erected at No. 1 by the same firm.

McIntosh, Hemphill & Co., of Pittsburgh, have completed a train of universal rolls for Carnegie, Phipps & Co., which is said to be the largest in the world. The total weight is 216,000 pounds, and with boilers and engines will cost $60,000. They are to roll armor plates from ingots weighing 30 tons.

Hardware.

The past week has been uneventful, trade continuing in slightly increased volume, and prices remaining without material change. The general tone of the market is firm, and in some lines there are indications of increased strength. Reports from different parts of the country indicate in most cases a good condition of business, and in some anticipations are entertained of an exceptionally good trade.

NAILS.

The New York market is quiet and steady. Some dealers and jobbers are making strenuous efforts to secure concessions for future delivery, while others report that they are fully supplied. Up to the present time the trade has not felt strongly the stimulating effect of the approaching busy season, except in more liberal purchases of small lots locally. Manufacturers quote $2 for carload lots of Iron Nails, and $2.10 for small lots from store.

At a meeting of the stockholders of the Old Dominion Iron and Nail Works Company, held on the 26th ult., at Richmond, Arthur B. Clarke was elected president; Douglass Baird, who has been for 40 years superintendent of the works, was made vice-president, and G. W. Catlett, long in the employ of the company, secretary.

BARB WIRE.

Eastern manufacturers report that orders continue to come in quite liberally, chiefly from the West, so that their capacity is taxed. They quote carload lots 4 cents, delivered.

MISCELLANEOUS PRICES.

Jersey City Smelting Works, Jersey City, N. J., issue the following prices, March 15, for their standard grades of Babbitt Metals. Terms: On orders of 500 pounds or over, 60 days, or 1½ per cent. discount for cash in 10 days. Less than that amount, 30 days, net, f.o.b., Jersey City or New York City:

	Per pound.
Anchor	5⅝¢
Star	9½¢
No. 4	13⅝¢
No. 2A	25⅝¢
A	33¢
Diamond	24⅛¢
Refined	7⅝¢
Star and Crescent	11⅝¢
No. 3	16⅛¢
No. 1A	31½¢
Genuine	37⅛¢
Extra No. 1	38⅞¢

The Champion Safety Lock Company, Cleveland, Ohio, announce an increase in their discounts, which, from this date, are 55 and 5 to 60 per cent.

Sise, Gibson & Co., 100 Chambers street, New York, issue a circular relating to the Bartlett Beef-Tea Press, No. 5, of which we recently gave a description, and for which they are the agents. The construction of this press is illustrated and the efficiency of its operation referred to. It is described as giving more pressure than other presses, and more than 10 times that of a lemon squeezer. No. 5, 3 inches in diameter and 3½ inches high, is sold at $6 per dozen, subject to a discount of 45 per cent.

Eastman & Mason, 100 Chambers street, New York, as announced in their advertisement on page 88, are manufacturing the Globe Fuel, of which an illustration is given. The standard size No. 3 is sold at $18 per dozen, subject to a discount of 33⅓ per cent.

The Chantrell Tool Company, Reading, Pa., issue a circular relating to their Chantrell's Perfected Bit Brace, which is illustrated both in the plain and ratchet patterns. Its advantages are also alluded to, and the point made that it will hold round Twist Drills with round shanks, as well as any Drill chuck, and, while it will hold any round shank as well as square, it will also hold the square shanks the same as the common Braces. The special features possessed by the Ratchet are also alluded to. William H. Jacobus, 90 Chambers street, New York, is agent for this line of Braces. The list prices are as follows, subject to a discount of 50 per cent:

Ratchet Bit Brace.

	Per doz.
No. 128, 8-inch Sweep	$33.00
No. 130, 10-inch Sweep	36.00
No. 132, 12-inch Sweep	39.00

Plain Bit Brace.

No. 106, 6-inch Sweep	21.00
No. 108, 8-inch Sweep	24.00
No. 110, 10-inch Sweep	27.00
No. 112, 12-inch Sweep	30.00
No. 168, 8-inch Sweep	10.25
No. 170, 10-inch Sweep	11.25
No. 172, 12-inch Sweep	12.50

The following are the list prices of Ives's Improved Door Bolts, manufactured by Hobart B. Ives & Co., New Haven, Conn., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, a description of which is given on page 90. The list as given is subject to a discount of 60 per cent.

	Per doz.
No. 8, Ornamental Knob and Escutcheon, Iron Bronzed	$2.60
No. 10, Ornamental Knob and Escutcheon, Nickel Plated	3 45
No. 12, Ornamental Knob and Escutcheon, Bronze Metal, No. 1 Finish	3.45
No. 14, Ornamental Knob and Escutcheon, Bronze Metal, No. 3 Finish	3.45
No. 15, Plain Knob and Escutcheon, Bronze Metal, High Polish, No. 1 Finish	4 00
No. 16, Plain Knob and Escutcheon, Bronze Metal, No. 2 Finish	4.00
No. 17, Plain Knob and Escutcheon, Nickel Plated	4 30

A large business is being done in Wood Planes, the prices of which remain without material change, ruling low and to some extent irregular.

Owing to the continued advances in Manila Hemp the manufacturers of Cordage have found it necessary to advance the prices of the Rope, the quotations on which are now as follows, with a discount of 1½ per cent. for cash in ten days. Sisal remains without change.

	Per pound net.
Manila, ½ inch and larger	10¾¢
Manila, ⅜ inch	11¼¢
Manila, ¼ and 5-16 inch	11¾¢
Manila Tarred Rope	10¼¢
Manila Hay Rope	10¾¢
Sisal, ½ inch and larger	9¾¢
Sisal, ⅜ inch	10¼¢
Sisal, ¼ and 5-16 inch	10¾¢
Sisal Hay Rope	9¾¢
Sisal Tarred Rope	9¼¢
Sisal Medium Lath Yarn	8¾¢

S. A. Haines, 90 Chambers street, New York, is calling the attention of the trade to a new Tape Line, a description of which we will give in a later issue. One of the points mentioned in regard to it is that it can be taken apart to put in a new line when the old is worn out. The following sizes are now made, 3, 5 and 50 feet, and others will soon be added. The prices are as follows:

3 foot, per dozen	$1.50
5 foot, per dozen	2.00
50 foot, per dozen	6.00

The Auger and Bit market shows evidence of a reaction from the low and irregular prices to which we referred in our last issue. Most of the manufacturers, if not all, have withdrawn their extreme quotations, and are now holding the goods at somewhat higher prices than have prevailed for some time. The fact that the goods have been selling at quite unremunerative prices appears to have a tendency to check the competition which has existed, and the market is regarded as firm, with some prospect of a still further strengthening.

The following is the list of prices of the Double Pointed Tacks, to which we referred in our last issue as manufactured by the Florence Tack Company, Florence, Mass.:

	Bright, Coppered and Blued. Per doz.	Tinned. Per doz.
No. 9	$1.20	$1.35
No. 10	1.20	1.35
No. 11	1.20	1.35
No. 12	1.44	1.60
No. 14	1.80	2.00
No. 16	2.00	2.20
No. 18	2.30	2.50

These Tacks, it will be remembered, are put up 144, 120 and 100 Tacks in a box, and to avoid any uncertainty as to the quantity, the number of Tacks in a box is printed on the outside label. The trade will appreciate the advantage of having this distinct designation of the quantity. The discounts on the above list for the different counts are as follows, with an additional 2 per cent. for spot cash:

	Dis. per cent.
144 count	80
120 count	80&10
100 count	80&10&10

A. H. WHITING,

successor to Whiting & Co., manufacturer of Black and Galvanized Sheet Iron Ware, 468 and 470 Cherry street, New York, makes the following quotations on his line of goods: Terms, f. o. b. New York, 60 days; 2 per cent. discount for cash if paid within 10 days.

Galvanized Iron Ware.

Ash and Garbage Cans and Covers, 60 per cent. discount from bottom list, as adopted by all manufacturers.

Well Buckets, 14-quart, No. 1, $4.75; No. 2, $4.25, per doz., net.

Fire Buckets, or No. 1 Pails, 10-quart, $2.75; 12-quart, $3; 14-quart, $8.25, per doz., net.

Heavy Buckets, or No. 2 Pails, 14-quart, $3.75; 16-quart, $4.50, per doz., net.

Extra Heavy Buckets, or No. 4 Pails, 14-quart, $7.75; 16-quart, $8.25, per doz., net.

Sap Buckets, 10-quart, $2.50; 12-quart, $2.75, per doz., net.

No. 1 Pails, without bails or ears, for Sap Buckets, 10-quart, $2.10; 12-quart, $2.40; 14-quart, $2.65 per doz., net.

Coal Hods, 70 per cent. discount from list.

Chamber Pails, No. 2, $45; No. 3, $48; No. 4, $51, per gross, net.

Chamber Pails, Gelb's Patent Commode, No. 3, $6; No. 4, $11 50; No. 5, $14, per doz.

Infant's Bath, 28 in., $2; 30 in., $2.25; 33 in., $2.50; 36 in., $3.25; 42 in., $4.25, each, less 40 and 5 per cent.

Oval Foot Tubs, No. 1, 12 x 15 in., $9; No. 2, 17 x 13 in., $10; No. 3, 19 x 13 in., $12; No. 4, 21 x 16 in., $14 per doz., less 40 and 5 per cent.

Lipped Milk and Water Pails, 10-quart, $4.50; 12-quart, $5.25; 14-quart, $6.25; 16-quart, $7, per doz., net.

No.	Per doz.	Per gro., net.
Refrigerator Pans, 0, 3¾ x 11½ in.	$1.75	$19.50
Refrigerator Pans, 1, 4 x 12½ in.	2.25	24.00
Refrigerator Pans, 2, 4½ x 13⅝ in.	3.25	36.00
Refrigerator Pans, 3, 5½ x 16 in.	6.00	66.00
Refrigerator Pans, 4, 5½ x 18 in.	7.25	81.00

Oil Waste Cans, 11 x 15 in., $10.50 per doz., net. Any other sizes or dimension to order at proportionate prices.

Storing Oil Cans, 15 to 50 gallons, at low prices.

Fire Buckets of every grade and description.

	Per gross. 13 in.	15 in	18 in.
Tinned Iron Loop Handle Basting Spoons	$4.50	$5.00	$5.50
Tinned Iron Wood Handle Basting Spoons	5.00	5.50	6.00
Tinned Iron Wood Handle Cake Turners	4.00	4.50	5.00
Tinned Iron Loop Handle Cake Turners	3.75	4.25	4.75
Tinned Iron Loop Handle Skimmers 4½ inch. diam.	4.50	5.00	5.50
Tinned Iron Wood Handle Skimmers, 4½ inch. diam.	5.00	5.50	6.00
Tinned Iron Twisted Wire Handle Forks, 2 prong	5.25	5.75	6.25
Tinned Iron Twisted Wire Handle Forks, 3 prong	5.75	6.25	6.75

NEW YORK SOUTHERN JOBBING TRADE.

We give below a review of some of the features of the trade of the New York jobbing houses with Southern Hardware Merchants immediately before and subsequent to the war. The article will doubtless be perused with interest, especially as referring to a business which is almost entirely

a thing of the past, new methods and new men in many cases having come to the front. In this review we are able to touch the subject in only a cursory manner, but we should be glad to have from any in the trade their fuller recollections in regard to the business, in order that the characteristics of the trade of those days may be recalled, and put on record for the pleasure of those who were in business at that time, and for the instruction of the younger merchants.

The recent deaths of William Bryce and Geo. W. Bruce removed two of the few remaining active members of the jobbing Hardware trade who were identified with it prior to and immediately after the War of the Rebellion. Both of these gentlemen occupied controlling positions in the firms to which they belonged, and during their later business career, as their competitors in the Southern and Southwestern cities became more numerous and more active in their efforts to secure trade, they witnessed many changes in the methods of doing business, as well as a large decrease in the margin of profit. In the years of their early career drumming for trade was comparatively unknown, but later on it became an important factor in business, and although repugnant to one at least of these gentlemen, its adoption was compulsory in order to prevent all the trade from being taken away. The result proved the wisdom of conforming to the new methods.

Reference was made in a former article to the large profits realized on sales prior to the war. The same remark applies also to sales made after the war. As the spring trade of 1861 was comparatively light, most of the houses were caught with large stocks of goods, many of which, intended for the Southern market, were not saleable elsewhere, and those who were able to carry their stocks until 1865 found that they had advanced enormously in value under the operation of the tariff and the high premium of gold existing at that time. A fair estimate would make the advance at least 100 per cent. The South being entirely destitute of goods the influx of would-be purchasers was very large, and the only difficulty that presented itself in making sales was the question as to credit of the parties applying. Cotton being very scarce and commanding a high figure, and the Northern merchants knowing the resources of the South in that respect, and bearing in mind the fact that others stood ready to take the risk in case of their refusal, were very easily persuaded to open accounts on the old long-time basis, relying on the cotton crop to come in for payment. In some cases the result proved that credit was given to those unworthy of it and a number of losses ensued, but probably not more than might be expected. The margin of profit, however, was large enough to leave a very satisfactory balance at the close of the year. The ante-warsoutherner, who had survived and desired to recommence business, was received cordially, and was able, without difficulty, to resume former business relations with his old business friends, and many of them referred to this in after years as the first step toward the prosperity that they subsequently enjoyed. An enormous trade was done for a very few years, the sales each month of some of the houses being as large as in after years for six months. At the outset the need for goods was so great that the question of prices was rarely considered. Having been limited for four years to the supplies furnished by the blockade runners, when the opportunity was furnished they bought very freely. Never in their history were the jobbers doing a Southern business so pushed to execute orders as at that time, and it was a great satisfaction to know that it was not all for glory, as is too often the case in these days. It was also greatly to the interest of the jobbers to push sales as rapidly as possible, as the decreasing premium on gold was lessening the value of goods, and the efforts of the American manufacturers who were just then introducing their products of newer and more desirable styles at very reasonable figures would, in a very short time, interfere greatly with the sale of the old-fashioned styles, if they did not altogether prevent it. The outcome is well known. The American manufacturers have driven 75 per cent. of foreign Hardware out of the market.

Most of the firms doing Southern trade, not only in Hardware, but in all lines, had large amounts due them when they were cut off from the South. Some of these merchants were unable to pull through, but to those that remained a good percentage of the old debts was paid in after years. The writer can recall many instances when not only the principal, but the full interest was paid, notwithstanding the objection of the creditor to receive the interest. This action on the part of Southern merchants is especially commendable and indicates a high standard of honor, when it is remembered that the Confederate Congress had passed a law compelling the payment to it of all debts due Northern merchants, and had appointed officers, with power, to inspect the books of all formerly doing business with the North and collect the amounts due. Some of the merchants, feeling the injustice of this law, both to their Northern friends and to themselves, prevented its execution in some cases by placing their books beyond the reach of the officers of the law, and in many cases ledgers and day-books were buried and otherwise concealed

The writer recalls distinctly the visit to New York for the first time after the war of D. W. Spence, an ante-war merchant of Georgia. He called upon the firms to whom he was indebted, and after the usual greeting stated that he desired to pay his old account. In this case his creditor replied that if not entirely convenient he would wait, and in the meantime expressed the hope that he had a long memorandum of goods which he would be pleased to sell him. "Will you please direct your bookkeeper to make out my account," said Mr. Spence. Directions were given; the account was made up and handed him. He perused it and then returned it, with the remark that if interest to the debt was added he would then pay, and, notwithstanding the objection of the firm, the account was paid with interest. With this resumption of business relations he remained a good customer of the firm until his sudden death several years later, while *en route* home after one of his semi-annual visits to this city.

Another party in Georgia who owed the house an ante-war debt wrote that he had no money, but had saved some cotton which if taken at 25 cents per pound was sufficient to pay 50 cents on the dollar. Would the firm accept the offer? The firm gladly did so, had the Cotton shipped North and after holding it for a while sold it for 60 cents per pound. Pretty good settlement!

Notwithstanding the bitter feeling engendered by the war, some of the Southern merchants felt very kindly toward the Northern merchants, for the reason that through the fortune of war a number found themselves on Northern soil as prisoners, and to the writer's personal knowledge many a package of clothing and other necessaries were forwarded, and gladly received by them.

ITEMS.

The Springfield Bicycle Mfg. Company, No. 9 Cornhill, Boston, have issued a very attractive illustrated hanger, which calls attention to their Springfield Roadster, the advantages of which are effectively illustrated, as compared with their view of the disadvantages connected with the use of other Bicycles. Some of the special features of the mechanical construction of the machine are also illustrated in detail.

The Union Indurated Fibre Company find it necessary to have increased facilities for handling their business. The growth of their trade in New England calls for special attention, and an office and store have been established in Boston at 46 Federal street, and 143 Congress street, with Theodore Pinkham as agent and manager. The Philadelphia office has been removed to a more central location at 58 N Second street, and May 1 the general offices of the company in New York will remove from 110 Chambers street to more comfortable and commodious quarters at 37 Barclay street, with entrance also at 42 Park Place. The general Western office has removed to 45, 47 and 49 Wabash avenue, Chicago.

It will be seen that Stiles Frost, 178 Devonshire street, Boston, Mass., illustrates his Anti-Rattler on page 103, giving full-sized cuts of the Spring, and also showing the effect of wear. It will be noticed that a sample pair will be sent free on application.

The Rector & Wilhelmy Company, Omaha, Neb, issue a handsome 40-page price current, which is devoted principally to seasonable goods. Prominent attention is called to Indurated Fibre Ware. Steel Goods and other Hardware suitable for spring trade are appropriately represented.

The Goulds Mfg. Company, Seneca Falls, N. Y., issue a special circular and price list of Spraying Pumps and Garden Engines, in which their Brass Hydronette, Portable Brass Aquaject, their Double-Acting Force Pumps, described in our last issue, and Garden Engines of different patterns are illustrated, together with nozzles, &c.

Hammacher, Schlemmer & Co., 209 Bowery, N. Y., issue an illustrated catalogue and price list of Refrigerator and Bar Trimmings. It represents a varied line of these goods, the different patterns of which are illustrated and prices also given.

The trade will observe the description given on page 592, of Reed's Patent Landing Net Frames, which are manufactured by John Shields & Co., Brookline, Mass., a house which for more than 30 years has been known to dealers in Fishing Tackle as manufacturers of Artificial Flies of superior merit, the senior partner being the inventor of the Enameled Waterproof Silk Fish Lines, which with other special articles of Fishing Tackle are extensively manufactured by this firm, and sold to the principal Sporting Goods dealers of the country.

Ross Bros., Worcester, Mass., issue an attractive catalogue showing the line of goods in which they deal, Agricultural Implements, Garden Tools, &c., being given a prominent place, Seeds also being fully represented.

The trade will observe the advertisement on page 65 in which the Empire Portable Forge Company, Cohoes, N. Y., call attention to their Empire Sash Pulley, with special reference to their Improved Anti-Splitting Pulley, in connection with the litigation to which reference was made in our last issue.

Peavey Bros., Sioux City, Iowa, issue a 72 page wholesale price current representing seasonable and staple goods. It is well printed and fully illustrated, giving on the front cover a view of their establishment.

W. D. Allen & Co., 151 Lake street, Chicago, issue under date April 2 a price current effectively printed in red and

black, relating to Garden Hose and Fixtures, Leather Belting, Packing, Hose, &c., in which quotations are given which are alluded to as being as low as those given their traveling salesmen. They state that their system of filling orders is simple and yet comprehensive, as they fill all freight orders received before 4 o'clock and all express orders received before 5 o'clock in the afternoon are forwarded the same day.

An auction sale of Hardware and House Furnishing Goods is announced for Wednesday and Thursday of next week, at 12 Murray street and 15 Park place, New York, under the direction of Haydock & Bissell. From the particulars, which are given on page 59, it will be seen that the sale includes an assortment of Edge Tools, Strap and T Hinges, Shovels, Enameled and Tinned Ware, a considerable quantity of Tacks, Steel Goods, &c.

The attention of manufacturers and those desiring a manufacturing investment is directed to the announcement, on page 62, of a factory, with its machinery, unfinished stock, &c., which is offered for sale. The business has been established for a number of years and the line of goods made are well known to the trade. The factory is offered on account of the recent death of the proprietor. Further particulars may be obtained by addressing Hezekiah King, 106 Chambers street, New York.

Nichols, Bellamy & Co., 189 Devonshire street, Boston, issue in unique and attractive form an invitation to visit their store, where they have displayed in a fine sample-room a complete assortment of Builders' Hardware. A calendar running from January, 1888, to July, 1889, is also furnished. This announcement of the completion of their sample-room will be received with interest, and their establishment, fitted up as it is with exceptional attractiveness and elegance, is deserving a visit from the trade.

John Pritzlaff Hardware Company, Milwaukee, Wis., issue a 24-page circular relating to seasonable goods, a varied line of which is represented. They state that, to meet the requirements of the Hardware trade of the Northwest, they have purchased freely, their stock never having been as large and as varied as at present. They have completed the enlargement of their main building, giving them an exceptionally large and well arranged establishment built for the Hardware business exclusively. As compared with 1887, their capacity for storage is nearly doubled, while their facilities for the prompt handling and shipping of goods have been greatly improved. The trade will receive with pleasure this announcement of the enterprise and growth of one of the oldest and largest Western houses.

McIntosh, Huntington & Co., Cleveland, Ohio, have issued an illustrated circular relating to spring goods, in which Screen Doors, Window Screens, Spring Hinges, Refrigerators, Lawn Mowers, Oil and Lamp Stoves, Water Coolers, &c., are given a prominent place.

"THE MAN OF SAMPLES."

This is the title of a readable and suggestive book by William H. Maher, who writes as one familiar with the trade, having experience as traveler, bookkeeper, buyer, and the head of a house doing an extensive business. It is an interesting book for merchants in general, exhibiting in an easy and pleasant style the methods of business as seen from the standpoint of a traveling salesman, but it is especially interesting to Hardwaremen, relating as it does to the Hardware business and narrating many incidents in which prominent jobbers and manufacturers and well-known salesmen are concerned. The book is an account of a trip made by the traveler of a Gun house, giving a description of his experiences on the road, in his contact with merchants and the representatives of competing houses. It thus illustrates the difficulties encountered by traveling salesmen, and the tact, skill and energy required to overcome them, as well as the questionable methods to which recourse is sometimes had for the purpose of securing orders. The interest of the volume is enhanced by the references which are constantly made to houses and persons well known to the trade, and in this way the names of Hibbard & Spencer, Disston, Simmons, Landers, Haines, Bingham, Russell & Erwin, Bartlett, Smyth, Buhl, Smith & Wesson, Wiebusch, and others are brought into the narrative, while in some cases concerns are introduced under suggestive disguises. In connection with the representation of the different types of merchants excellent points are incidentally made in regard to correct business methods, with the exposure of the trickery and meanness that sometimes characterize the purchaser's dealings with the houses from whom he buys and their representatives on the road. The references to special lines of goods, such as Guns, Screws, Auger Bits, Shot, Cutlery, &c., in which prices or some features of the market are alluded to, give the book a direct contact with the Hardware business, and help to make it, as it is, a volume of especial interest to the trade.

THE WARRANTY ON SAWS.

From numerous letters which we have received from Saw manufacturers, as well as from the trade, it is evident that the article which we published in our issue of March 15th in regard to condemned Saws was regarded with a good deal of interest, merchants alluding to the practice of their customers of returning good Saws, as an annoying and troublesome one to them, putting them in an awkward position as between the consumer and the manufacturer, while the manufacturers allude to it as the source of no inconsiderable loss, as many Saws of unquestioned excellence are returned to them. We give below a communication received from E. Andrews, of E. Andrews & Son, Williamsport, Pa., who has had long experience as a manufacturer of Saws, and who is thoroughly familiar with the subject on which he writes. From a perusal of his communication it will be seen that he is in favor, as are nearly all the Saw manufacturers, of the withdrawal of the sweeping warranty under which saws are usually, and have for so long a time been sold. We have also in hand letters from other manufacturers in which the same views are expressed and the point made that probably not more than one Saw in ten that are returned is really defective. To these letters we shall have occasion to refer in a later issue. Mr. Andrews writes as follows:

To the Editor of The Iron Age: As far back as 1873, when the representative Saw manufacturers from all parts of the United States met in convention for the first time in Pittsburgh, an effort was made to abolish the warranty on Saws, for the purpose of avoiding the abuse of the warranty system on the part of purchasers. A large majority at the convention favored no warranty. Since then the Saw manufacturers have had three other meetings, and at each the subject of warranty was discussed, and each time only one or two manufacturers objected to selling Saws on their merit. At the last meeting the question was warmly discussed, and all present acknowledged that the profit of the trade was very seriously diminished by reason of the return of so many good Saws, and all were ready to abolish the warranty except one manufacturing firm. That firm desired a modified warranty, but could not suggest a change that would prevent abuse. The Axe manufacturers have had the same trials and troubles with which the Saw manufacturers are confronted, and they applied the heroic remedy "no warrant" with beneficial effect Some time after "no warrant" was adopted one Axe manufacturer, believing the quality of his goods would warrant him in guaranteeing them, and that by so doing he would increase his trade, made the trial. One Hardware store that gave him an order and commenced selling warranted Axes had three out of the first half dozen sold returned. The balance of the dozen were sold without warranty, and no complaint was ever heard from any of the purchasers. As a rule, people buying warranted Saws or Axes put them to useless and unreasonable tests, and destroy or damage what might have been good tools with reasonable and practical use. It is not an uncommon thing to hear, "Jack, don't use that Saw or Axe that way; you will spoil it." "Oh, well; if I do I can take it back and get another. It's warranted." There seems to be one way to remedy the abuse of these tools, and that is no warranty. It is true there are such things as faulty Saws, but for every justifiable complaint it is within the line of truth to say there are 50 made without justification. Saws are made by men educated and skilled in their manufacture. They are used by more unskilled men than skilled. How few are capable of properly filing and setting a Saw, yet how many make the attempt, and because they are unsuccessful the Saw is condemned and returned in a damaged, and often worthless, condition. The warranty is construed to mean: *This Saw will work in the hands of any ignoramus; it requires no skill to put and keep it in order; it will work properly with the teeth out of shape; set or no set, it will stand any kind of abuse.* If it is a Circular Saw it must work well, no matter what may be the condition of the machinery, whether the power to drive it is insufficient or ample. If the price of logs goes up and sawed lumber goes down the Saw must turn out enough more work to reduce mill expenses sufficiently to keep up profits; if a worn-out sawmill is to be started up, a new Saw is expected to remedy and make good all faulty parts. A Saw that will not do all this and much more of a like nature is condemned and sent back to the Saw manufacturer, or he is requested to send a man to run the Saw at an expense much greater than the price of the Saw, but at no cost to the mill-owner—a practice which has recently been inaugurated. If the request is complied with, the man finds as a rule, on arriving at the mill, that an improper Saw has been ordered, or the mandrel it runs on has been sprung, or the Saw carriage is out of line, or the Saw has too many or not enough teeth, or it is too thin or too thick for the work, or it is too large for the condition the mill is in, or the sawyer is trying to do the same amount of work with a 20-horse engine as his neighbor is doing with 100 horse-power. For more than 40 years the writer has been a practical Sawmaker, has been watchful of and taken an active part in improvements for the manufacture of Saws, and he knows from experience that Saws are better made to-day than they were years ago. He also knows that there are more complaints about Saws to-day than when Saws were not half as well made, and the reason for this is the desire on the part of the user to force them beyond endurance.

A Saw is a piece of metal of limited strength, and the amount of its strength is governed by its thickness. Take a thin Hand-Saw and compare it with a thicker one, and in work it is very evident that the thicker Saw will stand more force applied to it without buckling than the thin one. It is the same with sawmill Saws. The more force applied to them the thicker they should be to withstand it, but owing to the increasing price of Saw logs the opposite rule is applied. Thinner Saws are called for, and are expected to stand up against any amount of power to increase the feed applied to them. The result is an almost universal complaint and condemnation of Saws. The time was when small mills talked of the annual product by the 100,000 feet. To-day the product is measured by millions, and they want to measure it by billions, and the Saws won't stand it. The Saw has been used by parties as a tool to experiment with at the ex-

pense of the maker. If a party thinks he wants a Saw with more or less teeth, thicker or thinner, larger or smaller, with this or that shaped teeth, he will order it of the manufacturer. If it works well, all right; if it does not, it is returned to the maker on the strength of its being warranted. Thus Saw-makers have for years been paying the loss for experimental Saws. While the Saw manufacturer is obliged to employ trained and skilled workmen to produce his goods, he is called upon by the abuse of the warranty to take back his best work because it has got into the hands of untrained, unskilled and inexperienced workmen. If Saw manufacturers could get a guarantee from the purchaser that the Saw would only be used by skilled workmen, would not be forced beyond the strength of the metal, or the power of the engine to keep up a steady motion, that the mandrel on which it was to be run was not sprung and the collars were true, and all parts of the machinery governing the Saw were in good order—then Saws could be warranted with but little risk to the manufacturer. Until the purchaser can give such a guarantee, the only remedy against abuse of the Saw-makers' warranty is to abolish all warranty on Saws. If, however, any one can suggest a warranty so qualified as to prevent the return and condemnation of good Saws, the trade would gladly adopt it. The trade is conducted by men who have no desire to impose bad work on a purchaser. Neither do they want to put up with the abuse of their warranty much longer, and pay and get back cost price of their goods.

ARRANGEMENT OF HARDWARE STORES.

The diagram herewith presented shows the arrangement of the retail Hardware and stove store of James C. Connor, at Evanston, Ill., which is in many respects a model. This store and its appurtenances occupy part of a brick block recently built by Mr. Connor with a special view to the purposes for which it is now used. The Hardware store is in the east end of the block, extending along an alley, thus securing side light and the advantage of side and rear entrances. Connected with the store and extending under the whole of it is a cellar, 8 feet high and well lighted, used for various purposes, which will be described in their proper connection. A large rear room in the second story of the building is devoted to a tin-shop, stove storage, and stocks of stove furniture.

The building is 120 feet deep. The first or street floor, however, is recessed for a depth of 6 feet; thus allowing a covered promenade in front of the store, the overhanging building being supported on ornamental brick columns located at the corners of the building and at a point opposite the dividing wall between the Hardware store and the neighboring store, thus presenting no obstruction directly in front. Coal vaults extend under the sidewalk and receive light in the usual manner. The store windows are of plate glass, and extend to the ceiling of the store, which is 14 feet high, thus furnishing, in connection with a side window, ample light for the interior of the salesroom. The front windows are guarded by a large nickel-plated rail, which extends across the front of them at a proper hight. As will be seen by the diagram, the salesroom and the smaller rooms in the rear of it do not extend to the full depth of the building, a space 20 feet deep being left, into which teams can be driven so as to load or unload under cover as well as to shelter the horses. The interior of the store is finished in oak and Georgia pine. The floors are of hardwood, the shelving and partitions of oak and the ceilings and sides are covered with Georgia pine. The counters have walnut tops, while the fronts are oak made artistically in 6-inch panels, divided into 4-foot sections by a heavy vertical molding.

Referring to the diagram, it will be observed that the arrangement of the salesroom is such as to secure an abundance of room. The whole space here covered is about 27 feet by 65 feet. The counters extend only on one side of the room, in immediate connection with the Hardware department. The shelving for this department extends along the whole of one side of the room. Wide shelves and drawers extend upward 2½ feet from the floor, and narrower ones from that hight to the top. The upper Hardware shelves are so ar-

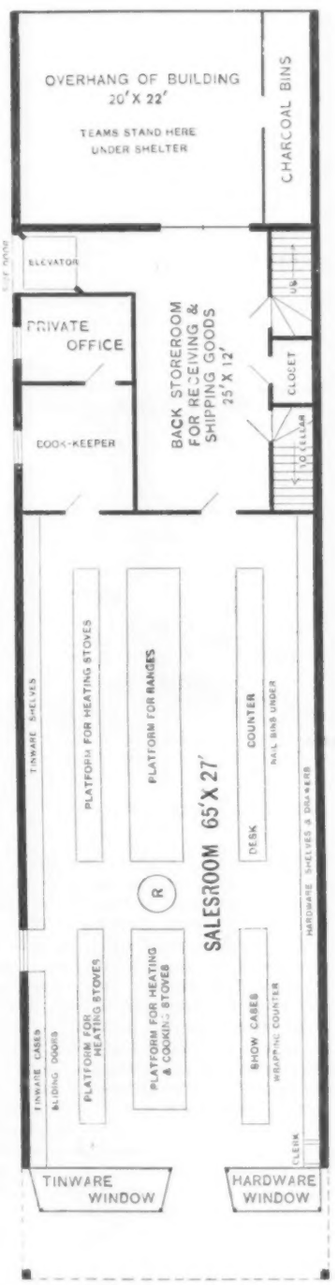


Fig. 204.—Diagram of Store of James C. Connor, Evanston, Ill.

ranged that the articles which are sold in broken packages are kept in small drawers placed nearest the window. There are about 335 drawers of this character, made of varying sizes, to suit the contents. The fronts are painted green, and a sample of the contents is fastened on the front of each. Goods sold in original papers are arranged on shelves toward the back of the store. The Bolt rack is located at the extreme end of these shelves, and consists of about 64 separate compartments or pigeon-holes, made of varying sizes, the large Bolts being kept in the lowest divisions. The large bins are 18 inches deep, 12 inches high and 7 inches wide, and the small 18 inches deep, 7 inches wide and 4½ inches high. The wide shelves and drawers, which form the lower part of the Hardware department, are of course used for large articles, such as Saws, Braces, Augers, Planes, and a variety of other articles. Strap and T hinges are arranged in a rack near the floor which is similar in appearance and construction to the Bolt rack, there being a separate compartment for each size, these compartments being 14 inches high, 13 inches wide and 18 inches deep. Nails are kept in bins under the rear counter, the bins being the full depth of the counter and having circular bottoms without any obstructing cross piece in front, so that a scoop can be easily used. The Stove platforms are so arranged that any Stove can be readily examined by customers, the aisles being kept free from goods of any character. The Tinware Cases are unusually handsome, having sliding doors so mounted that they move at a touch, while the contents are kept free from dust. Tinware of a more ordinary character is kept on another set of shelves not incased. Spades, Shovels and other D-handle goods are hung up on 8-inch harness hooks in a corner of the room, as noted on the diagram, while other agricultural tools which cannot be so treated stand upright in the lower part of the space. The shelving extends within 3 feet of the ceiling, the tops being made wide to accommodate Wash Boilers and other light but bulky goods. The Nail counter is 28 feet long and contains 18 bins, each 32 inches high, 17 inches wide and 20 inches deep. There are also seven bins under the Bolt rack of the same dimensions. All the store doors are hung with the Pneumatic Check and Spring to prevent slamming. Heat is supplied by a large furnace in the cellar which receives air from outside the building in ordinary weather and from the storeroom itself in extremely cold weather. The show windows are exceptionally large, and are kept tastefully dressed, one being used for Hardware and one for Tinware and House Furnishing Goods.

The small office rooms in the rear are luxurious additions to the usual Hardware store and are greatly appreciated. The back storeroom connects with the elevator and with large doors in the rear, where bulky goods are received and shipped. The elevator is operated by hand-power, and will carry 1000 pounds. It runs from the cellar to the second story, and has been found almost indispensable by reason of its convenience in handling heavy Stoves, Tin Plate, Tinware, &c., which have to be transferred from one floor to another.

The cellar is mainly used for the stock of Stoves, Nails, Iron and other heavy goods. It is divided into several compartments, however, one of which is used for a blacking room and another for Stove Repairs. The Stove Repair room is provided with a small lathe and other necessary tools. A considerable business is done during the summer in putting Lawn Mowers in order. The entrance to the charcoal bin is from the rear of the cellar, the bin being located as far from the store as possible, to guard against risk of fire. It is lighted with a number of windows as well as sidewalk lights, and the floor is well cemented and thoroughly dry.

Fig. 205 illustrates a method of handling oil which is in use in the store of Wade Bros., Hackettstown, N. J. In the corner of the store is a force pump which forces air into the pipe connected with it, from which it can be turned to any tank desired, by means of the faucet shown. The drawing represents the air as turned into the kerosene tank, and forcing the oil out into the measure. The air, as will readily be understood, is carried from the faucet through the pipe into the top

of the tank, thus forcing the oil out of the bottom of the tank through the pipe connecting it with the faucet, from which it is drawn as desired. The gauge shown in the cut is to indicate the amount of air pressure on the tanks, as too great a pressure might burst them. With a pressure of 10 pounds to the square inch, as indicated by the gauge, 2 gallons of linseed oil or 3 gallons of kerosene oil or turpentine may be drawn without further pumping. The tank should be placed on a platform in the cellar as close to the store floor as possible, as the higher it is necessary to force the oil the more pressure is required. The glass gauge on the side of each tank shows at a glance the amount of oil in the tank. The connecting pipes are ¾-inch galvanized iron and ¾-inch lead pipes. The tanks are made of galvanized iron, and require a timber across the top to keep the top from springing up and loosening the seams under pressure. The timber is bolted to the platform, and is not shown in the drawing. The manner in which the tanks are filled is also indicated. The barrel is tapped near the bottom, a faucet made for the purpose is inserted and a piece of hose run through a hole in the floor enters a hole in the top of the tank made by removing a screw cap. The oil will then run into the tank of itself, no pumping or other labor being necessary. The illustration represents a barrel of raw linseed being emptied. This method of handling oil has been in operation for several years, and is referred to as exceedingly satisfactory. Among the points mentioned in connection with it are that the cost of repairs has been merely nominal; that the space occupied by the fixtures for drawing six kinds of oil, as shown in the drawing, is less than 3 feet square, and that it has been found exceedingly convenient, permitting the drawing of the oil without going down stairs and leaving the customer alone in the store. The cost of this arrangement complete, including tanks, is estimated at about $150.

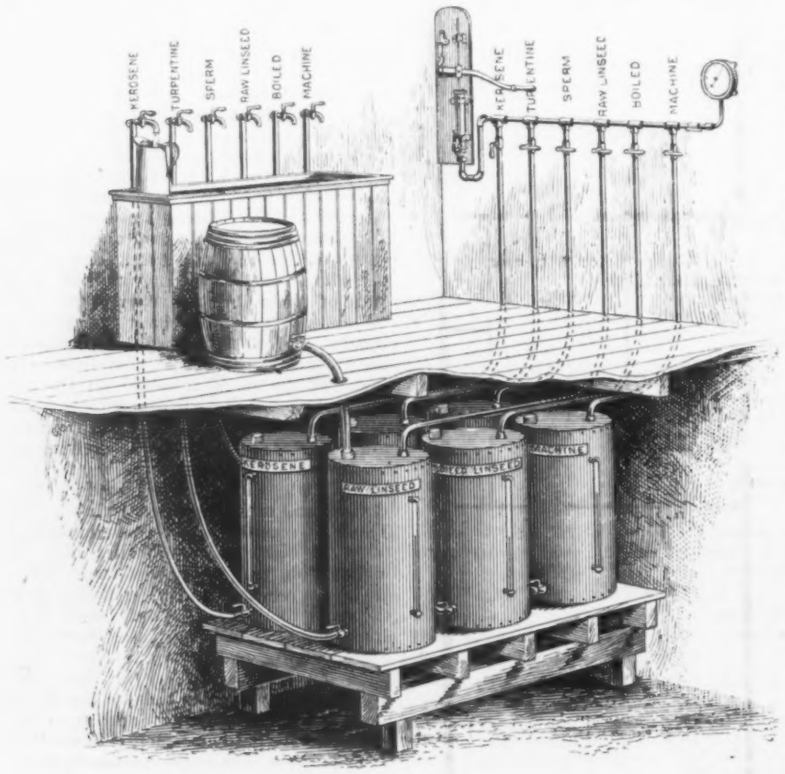


Fig. 205.—Wade Bro.'s Method of Handling Oil.

West & Wagner, Avon, Ohio, are manufacturing the Perfection Screw Case and Sample Rack shown in the following illustration, Fig. 206. This Case, the use of which is indicated in the name and shown in the illustration, is 32 inches high, its width on the top being 12 inches, and on the bottom 16 inches. It is intended to be placed on a counter or on other convenient stand. The outside is made of wood, and is described as well finished. It is arranged to hang samples on all sides, thus securing a fine display. The inside, which is intended for the accommodation of Screws, is made of tin and consists of eight tiers of boxes with an iron rod passing through the center from top to bottom. Each tier revolves separately, and is divided into eight or nine sections, each section being intended to hold one gross of Screws. The case thus accommodates 67 gross of Screws of the leading sizes from ½ inch 3, to 3 inch 16. One section in each tier except the bottom is omitted, so as to make it more convenient in filling and in removing the Screws. The outside case revolves independently of the inside Screw case. The manufacturers of this case, the purpose and convenience of which will be appreciated by the trade, expect soon to make other cases with accommodations for a considerably larger number of Screws.

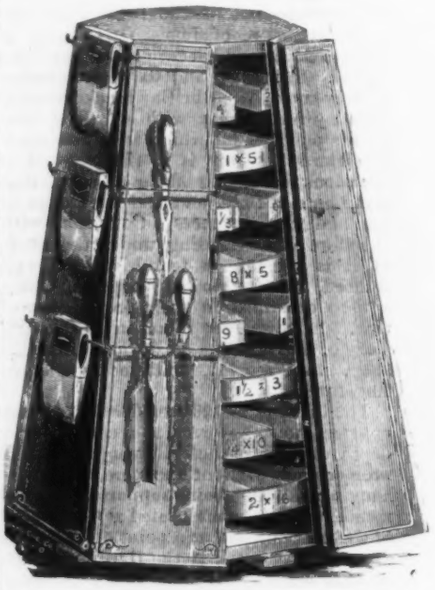


Fig. 206.—Screw Case and Sample Rack.

CALIFORNIA BUSINESS.

A recent issue of the San Francisco *Commercial Herald* gives the following remarks of Alfred Gallatin, of the well-known house of Huntington & Hopkins Company, of that city. As referring to the condition of California business and the outlook for the coming season it will be of interest:

While business in 1887 was good as a whole—the best in four or five years—the prospects of 1888 are fully as good, if not better. California is in the commencement of a series of prosperous years. This I believe for two reasons. In the first place history shows that we have had almost since the beginning of the Government alternate seasons of prosperity and depression. These have divided themselves into periods of 10 or 15 years. I remember well the depression of 1857–58. Through all the years since I have noted them, too, down to the last stringency of 1883. Since that time business has been improving all over the United States. California is having her turn and is getting the full benefit of the renewed confidence that has since prevailed. The good state of affairs now prevailing will continue for several years yet. In fact, into the nineties. Up to that time we will experience here a period of greater prosperity than ever before known, even in the palmy days of the early gold discoveries. The almost perfect climate, as well as the activity prevalent, are attracting a large immigration, that, in its turn, is contributing to the increase of our prosperity. The proper class of people are coming. Large ranches are being cut. Land that a few years ago would not bring over $1.25 an acre is now worth $5 to $20. It will keep on increasing in value as settlement proceeds, and division of large properties into smaller ones goes on. Settlement gives rise to greater production, demands greater transportation facilities and is the actual stimulus to a largely increased consumption. San Francisco merchants for several years have had a very sharp competition with Eastern houses. The result is the handling of a larger amount of goods, an increased volume of sales, but a greatly decreased percentage of profits. This city must depend largely on the country, and her progress will be in proportion to the development of the country. Our trade can be promoted not so much by an increase of territory as by a development of the territory that she at present supplies. The natural resources of the State are sufficient to sustain a thriving population of ten times its present numbers, and San Francisco merchants must work together to develop its resources.

The insurance companies of New York and vicinity still complain of heavy losses. It is stated that within the last ten years no less than 40 companies of New York and Brooklyn have retired from business, thus withdrawing $8,000,000 from the fire insurance capital of this city. As less than $2,000,000 have been added to the capital so employed, the net loss to the insuring public is a matter of much importance.

On the 27th ult. bids for castings to be used by the water department of Chicago were opened by the commissioner of public works and contracts awarded. The Crane Bros. Manufacturing Company secured the hydrants and stop valves at $39.95 per ton, while Russell & Roberts took the hydrant covers at $29.75 per ton.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	220.5
Picul	134.

CHILI.

VALPARAISO, February 3, 1888.—*Copper.*—Prices have ranged during the fortnight between $29 and $29.50 ₱ quintal; up to April 1 all Copper procurable has been sold for forward delivery. The agent of the French syndicate has been making an effort to secure output for two years to come, but it is not thought his endeavors will meet with any success to speak of. Total sales, 20,000 quintals, of which 8000 at $29.20, which equals £72. 18/10, with 30/ freight steam to Liverpool. *Nitrate.*—The flat cable advices have pretty much put a stop to dealings, producers refusing to submit to a decline. Sales were thus restricted to 179,000 quintals at $2.50 @ $2.52½ for 95 %, the latter equaling 7/8 ₱ cwt., with 27/6 freight and 25¾d. exchange. January export reached 57,000 tons to Europe, and 7500 to the United States; loading, 1st inst., 7000 and 5000 ingots respectively; charters during the fortnight, 6500 and 6300. *Coal*—Is firm at 31/ @ 32/6, English, and 29/6, Australian. *Exchange*, 25⅞. *Weber & Co.*

EAST INDIES.

MANILA, March 26, 1888.—*Hemp.*—There are buyers at $7.75 ₱ picul, against as much a year ago, equaling £28. 7/6 ₱ ton, cost and freight. Cleared for the United States since January 1, 39,000 bales, against 65,000 same time last year; loading for the United States, 18,000, against 13,000 cleared simultaneously; for England, 97,000, against 53,000; loading for ditto, 10,000, against 11,000; cleared for all other ports, 17,000, against 8000; receipts at all ports since last cable, 8000, against 11,000; ditto, since January 1, 136,000, against 105,000, in 1887, and 87,000 in 1886. Freight, $5. *Exchange*, 3/8½. *Ker & Co., to Chas. Nordhaus, per cable, direct.*

COLOMBO, February 16, 1888.—*Plumbago*—The market has been stiffening up for fine qualities. We quote at the close in rupees ₱ ton: Large Lumps, 145 ₱ picul; Ordinary Lumps, 115 @ 145; Chips, 80 @ 90, and Dust, 37.50 @ 60. Shipments since October 1st have been as follows: To England, 43,404 cwts.; to Marseilles, 33 cwt.; to Hamburg, 2557; to Antwerp, 1787; to Bremen, 206; to India, 82, and to the United States, 63,412 cwt., constituting a total of 111,486 cwt., against 84,523 in 1887, 65,954 in 1886 and 72,149 in 1885. We quote *Coir Yarn*, Nos. 1 to 4, 7 to 12 rupees ₱ cwt. *Exchange*, 1/5 3-16 for six months' sight credit.—*Volkart Brothers.*

WEST INDIES.

PORT OF SPAIN, TRINIDAD, February 17, 1888.—*Asphaltum.*—Our market has been moderately active and steady at $13.25 ₱ ton for Boiled and $5.50 for Crude. Since January 1 there have been shipped 8500 tons, against 1828 last year and 1720 in 1866. *Exchange*, 90 days, London, may be quoted $4.77 @ $4.83.—*A. P. Masson.*

CHINA.

SHANGHAI, February 3, 1888.—*Metals.*—The Government at Pekin is, we are assured, inclined to undertake the working of several mines in different regions of the country. Its plan seems to be to commence with working the Pingtu gold mines in the province of Shantung in a more thorough and scientific manner, which has hitherto not been the case. At the same time the Pingchuan Copper mines are to be taken in hand as well as the Teho Galena mines, under the supervision of an Englishman by the name of Church, after the most modern methods of mining and treatment. In these latter mines Mr. Church and consorts are to be interested; they will furnish a certain amount of capital toward pumping machinery and the plant generally. It is very much to be hoped that this revival in mining in the empire may be attended with success, inas. much as the country abounds in mineral resources in quite a number of provinces. There are the gold placers of Manchooria, the Iron and Coal mines of the provinces of Shensy, Schihly and Shansy, and the large Copper mines of Yunnan. *Chinese Times.*

SPAIN.

BILBAO, March 10, 1888.—*Iron Ore.*—Although there is a good deal of inquiry from England the dealings remained restricted at 6/6 @ 7/3 Rubios and 7/6 @ 8/ Campanil, as to quality. Shipments have meanwhile gone on briskly, running up 81,406 tons for the week. Should the dry weather continue they may next week reach 120,000 tons. Some 195,000 tons ship's room on board steamers are ready to take their turn in loading. Total shipments so far 724,031 tons, against 809,534 in 1887. *Pig Iron.*—There have been shipped 850 tons abroad and 1325 coastwise.—*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, March 24, 1888.—*Iron.*—The Rheinish-Westphalian market has been both lively and firm, Pig in particular. Spiegel has been in brisk request up to July 1 at 59 marks, 10 @ 12 % at Siegen, without much of an American demand. Forging is quite active, while the blast furnaces are scarcely able to deliver all that is required, there being indeed a scarcity. Orders for forward delivery are received all the way to October 1st. The quotation for the same is 52 marks. The inquiry for Foundry Pig is nearly as lively, at steady rates—say, at 51 @ 57 marks, as to quality. Bessemer has latterly also been moving off with greater ease, hence it has not been difficult to obtain an advance of 2 marks, the price now being 56 marks. There has been no abatement in the activity lately developed in Thomas, which easily brings 46 marks, Luxembourg not varying in the meantime. The position of Finished Iron is throughout a satisfactory one, the demand for domestic use being as pressing as heretofore. On the other hand, this is a great deal less the case as regards Beams, the building season being later than in former years. Hoops remain steady. Sheets generally enjoy a good demand, especially Boiler Plates, for which orders are pouring in in a steady stream many months ahead. All prices are well held, but not sufficiently high if we consider what the cost of raw material is. Thin Sheets form an exception; the demand for them might be better. The Wire branch exhibits no essential change, either in the demand or tendency. Wire Nails are readily taken to a moderate amount, consumers subscribing to the syndicate prices more willingly by degrees. They would indeed have done so before this if there were not some clashing interests thwarting the action of the syndicate. As a rule, machine shops and foundries are getting on satisfactorily. In Upper Silesia blast-furnace owners are of good cheer since they sold out to the Berlin Finished Iron syndicate, for forward delivery, all their product in 1889 and 1890 at the firm figure of 50 marks ₱ ton. While this is the case the owners of rolling mills in that district have been able to advance their price for Merchant Iron to 140 marks for delivery all the way to July 1st, and this in spite of the unusually late spring season. *Metals.*—Lead is firmer. Copper and Spelter are firm at unaltered rates.—*Borsenhalle.*

BELGIUM.

BRUSSELS, March 24, 1888.—*Iron.*—For the 3d prox. the Government has fixed an adjudication of 500 freight cars which it stands in need of for its railway line. Meanwhile the syndicate of Belgian Steel railmakers which had terminated on December 31 last has been renewed for five years. The Iron market as a general thing remains in good position, although there are some minor concerns with a momentary lack of orders, and they already begin to talk of curtailing their production. The general impression, however, still prevails that this slight disappointment is soon going to be overcome, there being well-founded reasons for looking forward to an immediate resumption in the demand for Beams on an extended scale. Merchant Iron is generally tolerably well sustained at 12 francs ₱ 100 kg., with some tendency toward improvement. Since Athus sold out his make of Forge Pig at 4.80 francs all the way to July 1, all Pig Iron has become stiffer than ever. The Charleroi blast furnaces are booked to the full extent of their capacity, and English Forge Pig again begins to be freely imported, Belgium not being able to cover its own requirements. Machine shops might be busier, especially those turning out locomotives, while carmakers are fully engaged. The outlook for Steel works is the reverse of cheerful just now, especially so far as Railmakers are concerned, although it seems that for the latter part of this year Germany will want quite a considerable quantity of Steel Rails. We are told the Ougrée Steel works will add to their Bessemer plant a Siemens-Martin one, and that several new furnaces are to be built in consequence.—*Moniteur Industriel.*

FRANCE.

PARIS, March 24, 1888.—*Metals.*—The spring demand has so far failed to come forward by reason of the bad weather that has been prevailing; meanwhile Copper and Spelter have been steady, whereas Tin and Lead declined. We quote at the close: *Copper*, Chili Bars, 202 @ 205 francs ₱ 100 kg.; Ingots and Slabs, 195; Best Selected, 200, and pure Corocoro Ore, 185; *Tin*, Banca, 440; Billiton, 435; Straits, 430, and English, 405; *Lead*, 36.50 @ 37.50, and *Spelter* 52.50 @ 53. *Iron.*—Nothing has occurred to affect the good outlook in France for the spring season. Although the quotation at Paris for Beams remains 13.50 francs ₱ 100 kg. and 14.50 for Merchant Iron, the Northern rolling mills are keeping us so well furnished that larger lots are readily obtainable on the spot for ½ franc less. In the Northern Department Iron continues moving off with great ease at 13.50 francs No. 2. Plates and Sheets are in such active request that an immediate raising is contemplated. Horseshoes have been advanced there by common agreement 1 franc, the price now being 25 francs ₱ 100 kg. At Longroy Pig Iron commands 4.80 for good quality Forge and 5.80 @ 6.80 for Foundry. Scrap Iron is scarce and held high. Old Rails are firm at 8 francs. We are informed from Charleville in the Ardennes that the situation is daily improving in that quarter. For years past makers have not booked as many orders as they are doing at present, and this extends pretty much to all branches, including Nails, Builders' Hardware and other similar articles. In the Haute-Marne things are less cheerful, inasmuch as a severe winter has somewhat interfered with the Iron trade, but this does not prevent Merchant Iron from being firmly held at 14.50.—*Moniteur des Intérêts Matériels.*

AUSTRIA.

VIENNA, March 21, 1888.—*Iron.*—The snowfall has been such that while in northern provinces of the Empire traffic has come to a standstill in the southern portion the thaw has rendered roads in the interior impassable, hence the week has been devoid of large dealings for immediate use, and both Pig and Finished Iron have been flat and inactive, except in a few specialties, in which a slight improvement has taken place. While ordinary Sheet Iron has been more neglected and weaker Galvanized was sustained. We quote at the close in florins ₱ ton: Pig Iron, 38 @ 47, Merchant, 110 @ 125; Sheets, 145 @ 175; Galvanized ditto, 255 @ 315, and Beams, 120 @ 127, all delivered in this city. *Metals.*—At the enhanced prices the consumptive demand has been sluggish. We quote at the close ₱ 100 kg.: Copper, 107 Lead, 23; Spelter, 27; Tin, 221 @ 223; Antimony, 54, and Brass from 46 to 60.—*Handels' Journal.*

RUSSIA.

ST. PETERSBURG, March 15, 1888.—*Petroleum.*—According to Burkhardt & Co.'s statement, the shipments of Refined Petroleum in cases from Batoum during the month of January were as follows:

	Cases.	Sailed.	For
Per steamer Kildare ..	107,262	Jan. 1.	Bombay.
		(Since wrecked).	
Per steamer Caledonia..	55,262	Jan. 18.	Calcutta.
Per steamer Cleddy....	64,337	Jan. 28.	Calcutta.
Per steamer Joseph Arbib.....	67,052	Jan. 31.	Calcutta.
Per steamer Glenmorven,...	86,000	Loading.	Calcutta.
Per steamer Glendower.	75,000	"	Calcutta.
Total.....	454,913		

—*Journal de St. Petersburg.*

The bridge now in course of construction over the Arthur Kill by the Staten Island Rapid Transit Company was inspected on Saturday by Secretary Endicott, accompanied by engineers, merchants and others interested. The act of Congress authorizing the work provides for a pivot draw, giving a clear water-way of 200 feet on each side of the pivot pier, which is already placed. For this, the opponents of the present plan propose to substitute a bridge with a draw span having 125 feet of clear opening on the New Jersey side of the bridge, next to which shall be a channel span giving a clear opening of 450 feet. Albert R. Boardman was counsel for both the Baltimore and and Ohio and the Rapid Transit Company, and made the argument in favor of the present Arthur Kill Bridge. The Pennsylvania Railroad Company were represented by F. Walcott Jackson and the Lehigh Valley Railroad by their counsel, W. S. Bissell. Mr. Boardman said that neither the Pennsylvania nor the Lehigh Valley Company had complained of obstruction until $300,000 had been expended on the new work. Now, in order to further their object of crippling a rival and preventing the Baltimore and Ohio Railroad from securing an entrance to New York, they had secured the introduction in Congress of an amendment which provided for an altogether different kind of bridge.

Reed's Patent Landing Net Frames.

The accompanying illustrations represent the special features of these frames, which are manufactured by John Shields & Co., Brookline, Mass. The form which the frame has when ready for use is shown in Fig. 1, and the manner in which the two parts of which the frame proper is composed are attached is indicated in Fig. 2, which shows the frame in different positions. By this construction it will be seen that when the net is not in use the frame can be readily taken apart for convenience in storing or carrying it in small compass. The frames are made of light spring steel about ⅝-inch wide, with suitable mountings, all of which are neatly and well made and finely finished. The trade will appreciate the advantages possessed by this article, which is put on the market with confidence that it will meet the need and taste of anglers in giving them a light, elegant and convenient landing net.

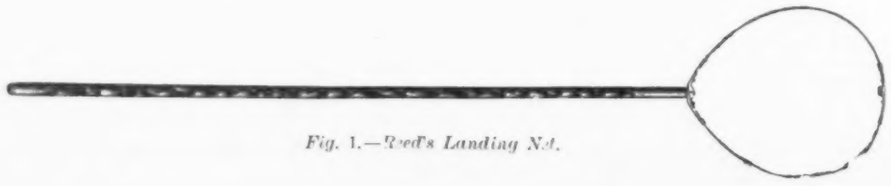
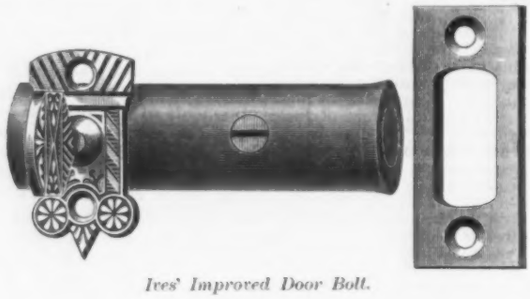


Fig. 1.—Reed's Landing Net.

Fig. 2. Frame of Landing Net.

New Mortise Door Bolt.

The illustration herewith given represents the Ives Mortise Door Bolt, which is manufactured by Hobart B. Ives & Co., New Haven, Conn., for whom John H. Graham & Co. are agents, 113 Chambers street, New York. This new bolt, which is intended for use on outside and inside doors, is quite similar to the Ives patent bolt, with which the trade are familiar, but embodies some improvements. It locks each way, when thrown out or reverse, and has the appearance in operation of an expensive lock. The design of knob and escutcheon is new and attractive, and is manufactured in several styles of finish. The manufacturers especially refer to the size of this bolt, ⅞ inch, as adapting it to a more common bit, while it is claimed that equally as good throw is secured as by other makes, which as a rule require a $1\frac{3}{16}$ inch bit for application.

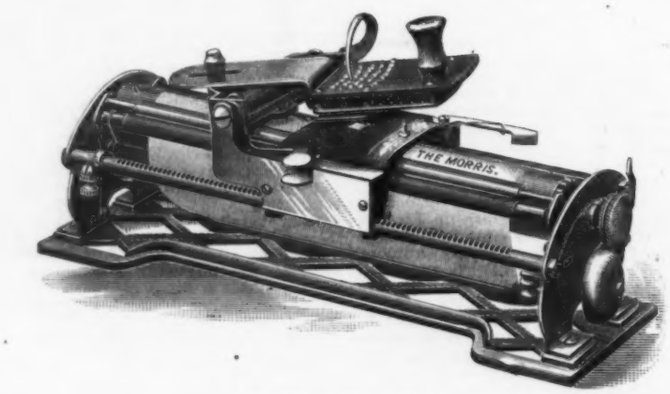


Ives' Improved Door Bolt.

The Morris Type-Writer.

The accompanying illustration gives a general view of the Morris Type-Writer, which is manufactured by the Hoggson & Pettis Mfg. Company, New Haven, Conn. The machine in its original form was invented by Mr. Robert Morris, who subsequently intrusted its manufacture to the above concern, by whom, after some important modifications, it has recently been put upon the market. A swinging and reciprocating platen carriage carries the type, which are made of India rubber, the faces projecting through holes in a metallic plate, so that they cannot move laterally, thus securing, it is claimed, accurate placing of the type. When the platen carriage is depressed sufficently one of the type is pressed against the paper which rests upon the roller. In order to guide the type to its place a guide pin is provided which projects upward and enters a countersunk hole in the platen, by which means the latter is held firmly in place while an impression is being made. The platen contains as many countersunk holes as there are letters and characters. Each hole corresponds to a particular character, and the manufacturers mention that the platen, when correctly set, cannot be depressed without the pin entering the proper hole. By this arrangement it is claimed that each letter is printed accurately in place and in alignment with the others. The type are set in the under side of the platen to the left of the guiding holes which may be seen in the cut. On the upper side of the platen, immediately above the type, the characters are engraved, and the finger, indicated in the cut, points out the letter that will be printed on depressing the platen. At every depression of the platen the type are pressed upon an inking pad, which is directly underneath, thus keeping them charged with ink. In the center of the pad is an aperture sufficiently large to permit one type to pass through, and through this aperture the impressions on the paper are made.

In operating the little knob shown in the engraving is held by the fingers of the right hand, the carriage being moved thereby until the desired letter comes under the indicator. The platen is then pressed downward, when the guide pin enters the countersunk hole, the type descends into its proper place, and the impression follows. Simultaneously the other type are brought in contact with the inking pad, thus keeping them in condition for printing. The platen after printing returns to its original position by pressure on a spring. As it rises the feed motion acts, and the carriage advances one letter space. Between words or at the ends of paragraphs different spacing can be secured, the thumb and finger pieces projecting from the front of the carriage being provided for this purpose. As the carriage bearing the platen approaches the end of the line a gong rings to notify the operator. The feed of the paper is managed by the rotation of the bed roller, which is effected by the milled head on the right of the machine, a stop motion being provided to secure accurate feed. Forty-five characters, including the complete alphabet, numerals, punctuation, per cent. and dollar marks, are contained on each sheet of type. The manufacturers make the following points in regard to the machine: That the type-plate is always in sight; that no ribbon is required, the machine doing its work by direct contact between paper and type; that it writes postal cards, envelopes, or any kind of paper up to 10 inches width equally well; that it is conveniently carried, and can easily be put into a valise or trunk in traveling; that the paper is quickly inserted and can be withdrawn with ease, and that the pad is easily inked and is not in a position where one is liable to daub the fingers. Its simplicity, compactness, durability and rapidity of opera-



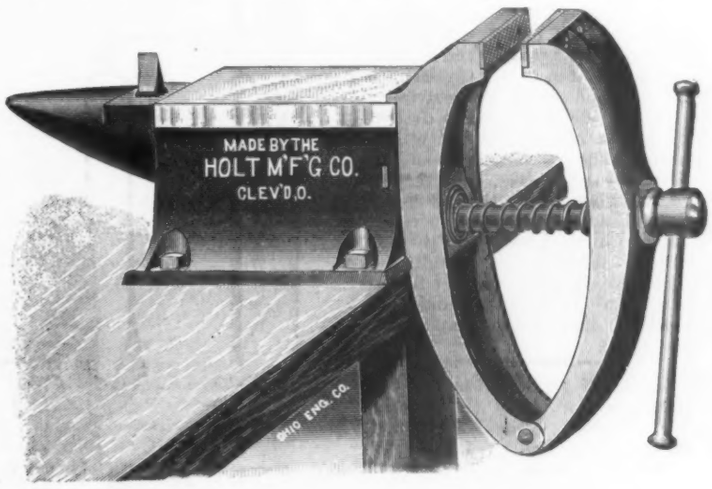
The Morris Type Writer.

tion, together with the low price at which tt is sold, are also referred to. Every portion of the machine, except the type-plate and rolls, is of metal, with interchangeable parts throughout. The weight of the machine is 4¼ pounds, and, with its box and appurtenances, 7 pounds.

Smith's New Revolver.

The accompanying illustration represents the working parts of an improved firearm of the class known as double-action automatic shell-ejecting revolvers, which is manufactured by Otis A. Smith, Rockfall, Conn., for whom Maltby, Henley & Co., 20 Warren street, New York, are agents. In this cut the different portions of the working parts of the pistol are designated as follows: Frame H, barrel M, cylinder B, hammer U, guard R, latch C, cocking dog E, sear F, trigger T, revolving hand D, auxiliary trigger S, disk N, stop Z, extractor dog O, extractor post P, extractor pin L, extractor A, main spring V, stirrup K, cylinder screw X, firing pin W. By reference to the cut the operation of the pistol will be readily understood. Among the improvements to which the manufacturer calls attention are that the barrel catch locking device is so constructed that the arm cannot be opened or closed unless the hammer is set at half-cock safety notch. Thus the arm cannot be closed when the hammer is at full-cock, thereby preventing accidental discharge by the thumb slipping off the hammer in cocking, this safety notch preventing the hammer from striking the firing pin. It will be seen that in the working parts of this arm there are few springs, all of which except the main spring are spiral, and there is little friction of parts to overcome when working the cocking lever. In the cocking lever is hung an auxiliary trigger for the purpose of throwing out the sear F, a construction which is referred to as overcoming the difficulty of the revolving hand having to pass the cylinder ratchet which is apparent in some revolvers and is an objectionable feature, since the cylinder is liable not to revolve to its proper place. The arrangement for extracting the shells is described as durable and practicable, as is also the arrangement for holding the cylinder on the barrel. Especial attention is called to the ease and dispatch with which the revolver can be taken apart to examine the mechanism for the purpose of cleaning, the only tool necessary being a small screw-driver which accompanies every pistol. This revolver is put on the market with confidence in its merits, and offered to the trade as possessed of valuable features and made in a superior manner.

Otis A. Smith's New Double-Action Revolver.



Holt's Anvil and Vise.

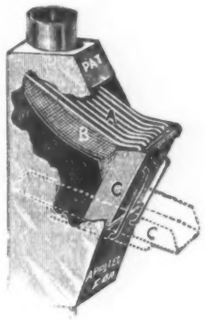
Several Chicago manufacturing establishments were burned out last week. On the 28th ult. the Western File Company, 63 and 65 South Clinton street, were sufferers from a fire which consumed the building in which their works were located, together with the Orlup & Pearson Wood Mantel Mfg. Company, and the Brunswick Billiard Table Mfg. Company. On the 29th the Zimmerman Refrigerator Company, 240–248 West Lake street, were among the victims of a fire which destroyed another large manufacturing building. All these parties were well insured.

Holt's Anvil and Vise.

The Holt Mfg. Company, Cleveland, Ohio, are making this article, which is represented in the cut given below. It is the invention of John P. Holt. This anvil is described as having a chilled cast iron face 7 x 3½ inches, being very hard and polished. The jaws are 3½ inches, and are faced with cast steel. The vise is so made that it can be separated from the anvil by driving out the key with a single stroke of the hammer, and can be used as a clamp when separated from the anvil. The back jaw has a lip projecting upon the anvil so that anything which is screwed into the vise can sustain heavy hammering. There are also two guides on the bottom of the anvil that keep the vise in plumb. The weight of the combined anvil and vise is about 55 pounds.

Double-Screen Strainer and Cut-off.

The Grand Rapids Cut-off Company, No. 9 Pearl street, Grand Rapids, Mich., are directing the attention of the trade to Wightman's Combination Double-Screen Strainer and Cut-off, an illustration of which is presented in the accompanying engraving. The features of the device are clearly shown and will be understood with very brief description. The coarse grate A and the opening of the front is to allow sticks, leaves, acorns, &c., to pass off as

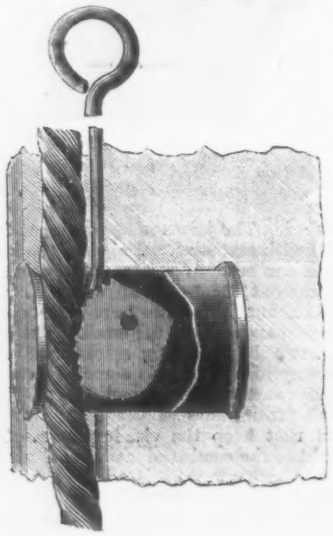


Double-Screen Strainer and Cut-Off

they are thrown down by the water. The fine sieve B, placed immediately under the grate, strains the water of anything that passes through the former and washes it into the cut-off C. By dropping the cut-off C into the position shown by the dotted line in the engraving and sliding it to the back, it forms a complete cut-off, thus making it possible to rinse the roof before allowing the water to pass into the cistern. Both strainers are removable and can be easily replaced in the event of accident to them. In the circular which the manufacturers put out they refer to the necessity and desirability of clean rain-water and of keeping rain-water free from leaves, bugs and the dirt washed from roofs.

The Rodgers Sash Cord or Chain Fastener.

This article is manufactured by the Nimick & Brittan Mfg. Company, Pittsburgh, Pa., and, as indicated by its name and shown in the accompanying cut, is a device for attaching cord or chain to window sash. The cut represents it full size inserted in the sash and holding the cord. It consists of a simple iron frame having a cam by which the cord is held. This cam can obviously be placed in such a position that the cord is easily inserted, and when the cord is drawn upward it is held rigidly



The Rodgers Sash Cord or Chain Fastener.

in place. To remove the cord or chain from the fastener a piece of wire about 12 inches long, as shown in the cut, is pushed down between the back of groove and the cord and pressed firmly on the top of the cam and the cord easily drawn out. When this device is intended for use with chain instead of cord a different cam is used. The simplicity of this fastener, the fact that there are no springs or complex parts to break or get out of order, and the economy of time and labor in its use, are points to which the manufacturers call attention.

Reed's Metallic Shelving.

A novelty in portable shelving has been brought out by Hugh T. Reed, 78 State street, Chicago, who has secured Letters Patent on his invention. This shelving consists entirely of metal. The posts are made of wrought-iron pipe, and the shelves of cast iron. The following cut, Fig. 1, illustrates a section of the shelving as erected.

A detailed illustration of the post, showing the manner in which it is constructed, as well as the method of attaching the shelves to it, is shown Figs. 2 and 3.

A represents the cap, which may be of brass or other ornamental design, B is the body of the post, E is the hole into which the screw-hook D is inserted for holding up the shelf, and C is the socket which can be screwed fast to the floor or

Fig. 1.—Reed's Metallic Shelving.

Fig. 2.—Details of Post.

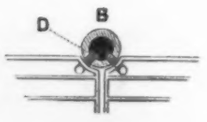


Fig. 3.—Method of Attaching Shelves.

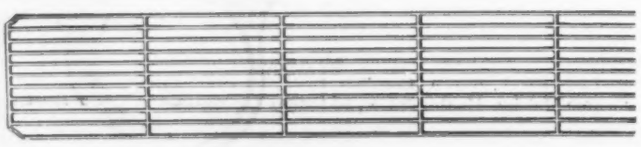


Fig. 4.—View of Shelf.

to the top of a counter. Holes can be drilled into the body of the post for as many screw-hooks as may be needed, as indicated in the sectional cut above given, thus providing for continuous shelving or for corners. The shelves are quite light, being cast in open-work and but ¼ inch thick, but they are sufficiently strong. Fig. 4 of the cuts represents one of the shelves lying flat. The combinations which can be made of this shelving are almost endless, while its advantages are many and obvious. Two or three tiers can be put together for wide shelves. The shelves themselves can be cast of any width or length desired. The shelving can stand against a wall or partition, or in the center of the floor. No dust collects on the shelves, and they do not warp or shrink, while their thorough coating of japan keeps them from rusting. Being simply hooked together, they are no trouble to move. The inventor has introduced this shelving to a very limited extent, and would be willing to make arrangements for its manufacture and sale on a larger scale.

The quarries of H. E. Mussey & Co., Elyria, Ohio, are located at the junction of the two divisions of the L. S. and M. S. R. R. and also the C. L. and W. R. R. They are connected with these railroads, having switches running into and through the quarries, so that they can load directly on to the cars. They are now working their rock 80 feet deep and have not found the bottom, the entire mass being referred to as the genuine grindstone grit. They intend working this season about 100 men, which with all the latest improved machinery, such as steam channelling machines, drills, derricks, lathes, &c., will secure a large product.

Adjustable Lumber Hoist.

Every builder engaged in putting up frame structures will appreciate the advantages of the hoisting attachment illustrated in the engravings. It is a simple clamp adapted to be attached to any upright post or stud of the frame, and which, by means of the curved arm, extends outwardly, carrying the block through which the rope runs for hoisting material. A similar clamp is provided for the lower end of the rope, which engages with the stick to be raised in a way to save all trouble in tying knots or wrapping the rope around the timber. The saving of time in the use of this device is its most important feature. The clamp here shown

Adjustable Lumber Hoist.

is manufactured by W. S. Welch, Westfield, N. J. With reference to the capacity of this device the maker informs us that it is adapted to fasten to uprights from 2 x 2 in size to 4 x 6, and that the grip will carry timbers ranging from 2 x 6 to 6 x 12. The small cut shows the position of the device for dropping over the timber ready to hoist up.

CURRENT HARDWARE PRICES.

APRIL 4, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢
R. B. Trimmed Edge, 1-10's.....65¢ } dis 25@ 25&
R. B. Ground Edge, Central Fire, 1-10's. 70¢ } 7½ %
Double Waterproof, 1-10's.....$1.40
Musket Waterproof, 1-10's.....52¢ @ 53¢
G. D.....28¢
S. B.....30¢
Union Metallic Cartridge Co.
F. C. Trimmed.....50¢
F. L. Ground.....65¢ } dis 25@ 25&
Cen. Fire Ground.....70¢ } 7½ %
Double Waterproof.....$1.40
Double Waterproof, in 1-10's.....$1.40
G. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 58¢
Eley's D Waterproof, Central Fire.....$1.60

Cartridges—
Rim Fire Cartridges.....dis 50&5&2 %
Rim Fire Military Cartridges.....dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle...dis 25&5&2 %
Cen. Fire Cartr., Military & Sporting....dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges 22 cal.....$1.75, dis 2 %
Blank Cartridges, 32 cal.....$3.50, dis 2 %
Primed Shells and Bullets.....dis 15&5&2 %
B. B. Caps, Round Ball.....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged.....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....$1.00, dis 2 %
All other Primers, all sizes.....$1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge...dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list).....dis 30&10&2 %
Star, Club, Rival and Climax Brands, 10-gauge, $9 list } dis 33½&10 %
Star, Club, Rival and Climax Brands, 12-gauge, $8 list } 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....dis 30&10&2 %
Selbold's American Combination Shot Shells.....dis 15&2 %
Brass Shot Shells, 1st quality.....dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %

Shells Loaded—
List No. 19, 1887.....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up.....$2.00
U. M. C. & W. R. A.—B. E., 9&10.....2.30
U. M. C. & W. R. A.—D. E., 7&8.....2.60 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 11 up.....3.10
U. M. C. & W. R. A—P. E., 9&10.....4.00
U. M. C. & W. R. A.—P. E., 7&8.....4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E. 11 @ 20.....$2.80

Anvils.—Eagle Anvils.....₩ ℔ 10¢, dis 20 @ 20&5 %
Wright's.....9½¢
Armitage's Mouse Hole.....8¾¢
Armitage Mouse Hole, Extra.....11¾@11¾¢
Trenton.....9¾@9¾¢
Wilkinson's.....9¾¢@10¢
J. & Riley Carr. Patent Solid.....11@11¾¢

Anvil Vise and Drill—
Millers Falls Co.....$18.00, dis 20 %
Chenev Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise.....$3, dis 40&10 %
Moore & Barnes Mfg. Co.....dis 33⅓ %

Augers and Bits.

Douglass Mfg. Co. } dis 70@70&5 %
New Haven Cooper Co. } dis 70@70&5 %
Wm. A. Ives & Co. } dis 70@70&5 %
Humphreysville Mfg. Co. } dis 70@70&5 %
French, Swift & Co. (F. H. Beecher) } dis 70@70&5 %
Cook's, Douglass Mfg. Co.....dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 10, extension lip.....dis 40 %
C. E. Jennings & Co., No. 30.....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32½ quarters, No 5, $5; No. 30, $2.....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings' Bits (new list).....dis 60@6.5&5 %
Pugh's Black.....dis 20 %
Car Bits.....dis 50&10&60 %
L'Hommedieu Car Bits.....dis 15&10 %
Forstner Pat. Auger Bits.....dis 10 %

Hollow Augers—
Ives' } dis 25&10 @ 25&10&5 %
French, Swift & Co. } dis 25&10 @ 25&10&5 %
Douglass'. } dis 25&10 @ 25&10&5 %
Bonney's Adjustable ₩ doz. $45.....dis 40&10 %
Stearns'.....dis 20&10 %
Ives' Expansive, each $4.50.....dis 50&10 %
Universal Expansive, each $4.50.....dis 20 %
Wood's.....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $26.....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60.....dis 35 @ 40 %
Swan's.....dis 40 %
Steer's, No. 1, $26; No. 2, $22.....dis 35 %
Stearns' No. 2, $48.....dis 20 %

Gimlet Bits—
Common.....₩ gross $2.75 @ $3.25
Diamond.....₩ doz. $1.10, dis 25&10 %
"Bee".....dis 25 @ 25&5 %
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co.....dis 30&10 %
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....dis 40&10 %
Double Cut, Ives'.....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Syracuse, for metal.....dis 50&10&5 %
Syracuse, for wood (wood list).....dis 30 @ 30&5 %
Williams' or Holt's, for metal.....dis 50&10&10 %
Williams' or Holt's, for wood.....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's.....dis 15&10 %
Watrous's.....dis 15&10 %
Snell's.....dis 15&10 %
Snell's Ship Auger Pattern Car Bits.....dis 15&10 %

Awl Hafts.

Sewing, Brass Ferrule.....$3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short.....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₩ doz.—net
Patent Peg, Plain Top.....$10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top.....$12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.

Awls, Sewing, Common.....₩ gross $1.70—dis 35 %
Awls, Shouldered Peg....₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg.....₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad.....$2.70 ₩ gross—dis 35 %
Awls, Handled Brad.....$7.50 ₩ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch.....$1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.

Aiken's Sets, Awls & Tools, No. 20, ₩ doz. $10—dis 50&10 %
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18.; 3. $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Henry's Combination Haft.....₩ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50. } dis 30&10 %

Axes.

Makers' and Special Brands—
First quality.....₩ doz, $6.25 @ $6.50
Others.....₩ doz, $5.75

Axle Grease.

Fraser's, in bulk.....Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Frasers, in boxes.....₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting.....10-℔ pails, each, 85¢
Lower grades, special brands.....₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.

Nos. 7 to 18.....dis 40&10 @ 50 %
Nos. 19 to 22.....dis 60&10 @ 60&10&10 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets.....dis 33⅓ %
Over 10 sets.....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets.....dis 10 %
Over 10 sets.....dis 10&5 %

Bag Holders.

Sprengle's Pat., ₩ doz $18.....dis 60 %

Balances.—Spring Balances.

Common Spring Balances.....₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances.....dis 50 %
Chatillon's Circular Spring Balances.....dis 60 %

Bells.

Alumd—
Light Brass.....dis 70&10 %
Extra Heavy.....dis 60&10 %
White Metal.....dis 60&10&10 %
Silver Chime.....dis 25&10&5 %
Globe (Cone's Patent).....dis 25&10 @ 35 %

Cast—
Gong, Abbe's.....dis 25&10 @ 35 %
Gong, Yankee.....dis 40&10 %
Gong, Barton's.....dis 40&10 @ 50 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, H. B. & Co.'s.....dis 50&10&2 %
Pull, Brook's.....dis 50&10&2 %
Pull, Western.....dis 25&10 %

Cone—
Common Wrought.....dis 60&10 %
Western.....dis 20&10 %
Western, Sargent's list.....dis 70&10 %
Kentucky "Star".....dis 20&10 %
Kentucky, Sargent's list.....dis 70&10 %
Dodge, Genuine Kentucky, new list, dis 70@70&10 %
Texas Star.....dis 50&10 @ 50&10&5 %

Tail.....dis 40@40&5 %
Farm Bells.....₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.—Blacksmiths'.....dis 60&10&5 @ 60 %

Molders'.....dis 40&10 @ 10 %
Hand Bellows.....dis 40&10 @ 10 %

Belting, Rubber.

Common Standard.....dis 75 %
Standard.....dis 70&5 %
Extra.....dis 60&10 %
N. Y. R. & P. Co., Standard.....dis 60&5&5 %
N. Y. R. & P. Co., Extra Standard.....dis 50&10&5 %

Bench Stops.

Morrill's.....₩ doz $9—dis 50 %
Hotchkiss'.....₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9...dis 25&10&5 %
McGill's.....₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's.....₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives'.....₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal.....₩ doz $24.00—dis 40 %
Angular.....₩ doz $24.00—dis 40&5 %

Blind Adjusters.

Domestic.....₩ per doz $3.00—dis 33⅓ %
Excelsior.....₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking.....dis 20 @ 20&10 %

Blind Fasteners.

Mackrell's.....₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern.....$15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern.....$15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern.....$9 ₩ gro. net
Merriman's.....new list, net
Austin & Eddy No. 2008.....$9 ₩ gro. net
Security Gravity.....$9 ₩ gro. net

Blind Staples.

Barbed, ⅞ in. and larger.....₩ ℔ 8 @ 8½¢ net
Barbed, ¾ in.....₩ ℔ 9 @ 9½¢ net

Blocks.

Ordinary Tackle, list April 17, '85.....dis 40 @ 40&5 %
Cleveland Block Co., Mal. Iron.....dis 50 %

Bolts.

Door and Shutter—
Cast Iron Barrel, Square, &c.....dis 70 @ 70&10 %
Cast Iron Shutter Bolts.....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list).....dis 60&10 %
Ives' Patent Door Bolts.....dis 55 %
Wrought Barrel.....dis 70 @ 70&10 %
Wrought Square.....dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list.....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's.....dis 40&10 %
Wrought Shutter, Sargent's list.....dis 60&10 %
Wrought Sunk Flush, Sargent's list.....dis 55&10 %
Wrought Sunk Flush, Stanley's list....dis 40&10&5 %
Wrought B. K. Flush, Com'n Stanley's list, dis 55&10 %

Carriage—
Com. list June 10, '84.....dis 70&10&5 %
Genuine Eagle, list Oct., '84.....dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, 84...dis 75&10@75&10&5 %
R. B. & W., old list.....dis 70 %

Tire—
Common, list Feb. 28, 1883.....dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883.dis 65&10 %
P. C. B. & N. Co., Philadel., list Oct. 84.....dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list, Oct.'84.....dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct.'84..dis 75&10 %
Am. S. Co., Norway, Phil., list Oct.16,'84..dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct.16,'84.....dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84.....dis 82½ %
Am. S. Co., Bay State, list Feb. 28,'83....dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884.....dis 82 %
R. & E. Mfg. Co.....dis 65 %

Stove and Plow—
Stove.....dis 62½ %
Plow.....dis 60&5 %
Am. S. Co. Stove, Annealed.....dis 62½ %
R. B. & W., Plow.....dis 55 %
R. B. & W., Stove.....dis 62½ %
R. & E. Mfg. Co., Stove.....dis 62½ %
Machine.....dis 75&75&5 %
Bolt Ends.....dis 75&75&5 %

Borax.....₩ ℔ 9½@10½¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent	5.50	6.75, dis 40&10&10 %
Jennings	5.50	6.75, dis 45&45&10 %
Other Machines	2.35	2.75.....net
Phillips' Pat., with Augers	7.00	7.50.....net

Bow Pins

Humason, Beckley & Co.'s.....dis 60&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck, Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.

Backus, Nos. 110 to 114 and 31 to 33...dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14.....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 .9, 11.....dis 70&10&5 %
Barber's, Nos. 10 to 16.....dis 50 %
Barber's, Nos. 30 to 33.....dis 50 %
Barber's, Nos. 40 to 63.....dis 50&10 %
Barker's, Nos. 8, 10 and 12.....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12.....dis 65&10@70 %
Osgood's Ratchet.....dis 40&10&5 %
Spofford's.....dis 50&10 %
Ives' New Haven Novelty.....dis 70 @ 70&5 %
Ives' New Haven Ratchet.....dis 60&5 @ 60&10 %
Ives' Barber Ratchet.....dis 60&5 @ 60&10 %
Ives' Barbers.....dis 60&5 @ 60&10 %
Ives' Spofford.....dis 60&5 @ 60&10 %
Common Ball, American.....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30.....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118.....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Plain.....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled.....dis 65&10 @ 70 %
Amidon's Ratchet.....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet.....dis 60 %
Amidon's Globe Jawed.....dis 40&40&10 %
Amidon's Corner Brace.....dis 40 @ 40&10 %
Amidon's Universal.....8 in., 42.10; 10 in., $2.25
Amidon's Buffalo Ball.....$1.10 @ $1.15
P. S. & W.....dis 50&10 %

Brackets.

Shelf, plain, Sargent's list.....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list.....dis 60&10 @ 60&10&10 %
Reading, plain.....dis 60&10 @ 60&10&5 %
Reading, Rosette.....dis 60&10 @ 60&10&10 %

Bright Wire Goods.—.....dis 75&10&10@—%

Broilers.	Inch.	9	10	9 x 11
	Per doz.	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut.....dis 55 %

Sargent's.....dis 66⅔&10 @ 70&5 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70 %
Peck, Stow & W. Co.'s.....dis 50&10 @ 50&10&10 %
Elirich Hdw. Co., White Metal, low list.dis50@50&10 %

Butcher's Cleavers.

Bradley's.....dis 25 @ 30 %
L. & I. J. White.....dis 20&5 f
Beatty's.....dis 40 @ 40&5⅓

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40 %
P. S. & W.....dis 33⅓&5@33⅓&10 %

Butts.

Brass—
Wrought Brass.....dis 70@70&10 %
Cast Brass, Tiebout's.....dis 33⅓ %
Cast Brass, Corbin's Fast.....dis 33⅓&10 %
Cast Brass, Loose Joint.....dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow.....dis 50&10 %
Fast Joint, Broad.....dis 55&10 %
Loose Joint. } dis 66⅔&10 %
Loose Joint, Japanned. } dis 66⅔&10 %
Loose Joint, Jap. with Acorns. } dis 66⅔&10 %
Parliament Butts. } dis 66⅔&10 %
Mayer's Hinges. } dis 66⅔&10 %
Loose Pin, Acorns. } dis 66⅔&10 %
Loose Pin, Acorns, Japanned. } dis 66⅔&10 %
Loose Pin, Acorns, Jap, Pltd. Tips. } dis 66⅔&10 %

Wrought (Steel)—
Fast Joint, Narrow.....dis 70@70&5 %
Fast Joint, Lt. Narrow.....dis 70@70&5 %
Fast Joint, Broad.....dis 70@70&5 %
Loose Joint, Broad.....dis 70&5@70&10 %
Table Butts, Back Flaps, &c.....dis 70@70&5 %
Inside Blind, Regular.....dis 70@70&5 %
Inside Blind, Light.....dis 70@70&5 %
Loose Pin, Wrt.....dis 70&5@70&10 %
Loose Pin, Light.....dis 70&5@70&10 %
Bronzed Wrought Butts.....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe.

Gautier.....₩ ℔ 5½@6¢
Dewicks.....₩ ℔ 5½@6¢

Can Openers.

Messenger's Comet.....₩ doz $3.00, dis 25 %
American.....₩ gross $3.00
Duplex.....₩ doz 35¢, dis 15 @ 20
Lyman's.....₩ doz $3.75, dis 20 %
No. 4. French.....₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle.....₩ gross $6.00, dis 45 @ 50 %
Eureka.....₩ doz $2.50, dis 10 %
Sardine Scissors.....₩ doz $7.00, dis 55 %
Star.....₩ doz $5.00, dis 25&5 %
Sprague, No. 1. ₩ ; 2. ₩ , ₩ $2.50.....dis 50&10&10 %

World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₩ doz $3.00, dis 35&5 %
Domestic.....₩ doz $2.50, dis 45 %
Champion.....₩ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool..... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₩ doz $3.25
Cast Iron, Steel Points.....₩ doz 80¢
Sockot.....₩ doz $1.75
Bullard's.....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5.....₩ doz $17.00
Bissell No. 7 New Drop Pan.....₩ doz $19.00
Bissell Grand.....₩ doz $36 00
Grand Rapids.....₩ doz $24.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₩ doz $15.00
Jewel.....₩ doz $17.00
Mystic.....₩ doz $16.00
Cottage.....₩ doz $15.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Queen.....₩ doz $16.00
Queen, with band.....₩ doz $18.00
King.....₩ doz $30.00
Weed Improved.....₩ doz $18.00
Rub.....₩ doz $16.00
Cog Wheel.....₩ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed, Plate, Shallow Socket, Deep Socket, Yale Casters, list May, 1884.....dis 30&10&40 %
Yale, Gem.....dis 60&60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti-friction.....dis 60 @ 60&10%
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

New list: Brass...dis 55 %; Others..dis 60 %

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 66⅔&10 %
Notchkiss.....dis 30 %
Beck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6¼-10-2, exact sizes, ₩ pair, $1 03 @ 1.11; Trace, 6¼-10-3, exact sizes, ₩ pair, .92 @ 1.11; Trace .7-10-2, exact sizes, ₩ pair, 1.11 @ 1.11.....dis 50&10&2½ %
NOTE.—Traces, "Regular" sizes 3¢ net ₩ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 9.00 6.30 5.25 4.60 4.40 4.20 3.95 3.75
Less than cask lots, add ¼@¾¢ ₩ ℔.
German Coil, list of June 20, 1887...dis 50&10&3@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35&2 %
Oneida Halter Chain (old list).....dis 45 %
Galvanized Pump Chain.....₩ ℔ 6¢ @ 6¼¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

Chalk.
White.....₩ gro 55¢
Red.....₩ gro 75¢
Blue.....₩ gro 90¢
White Crayons.....₩ gro 12¢ @ 12½¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
Witherby and Douglas, P., S. & W., New Haven and Middlesex, Mix.....dis 75&5 @ 75&10 %
Buck Bros.....dis 70 %
Merrill.....dis 60&10@50&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₩ ℔.....16¢ @ 19¢

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 66⅔&10 %
Carriage Makers', Sargent's.....dis 66⅔&10 %
Eberhard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₩ ℔ 5½¢
Steel Felloe Clips.....₩ ℔ 5¢

Cockeyes......dis 50 %

Cocks, Brass.
Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. , 1888.....dis 50&2 %
American, Enterprise Mfg Co.....dis 20&10@30 %
The "Swift," Lane Bro's.....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers.....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20&20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Bowe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&10 %

Crow Bars.
Cast Steel.....₩ ℔ 4¢
Iron, Steel Points.....₩ ℔ 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₩ doz $10.00, dis 20 %
Perfect.....dis 50 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Westenholme.....$7.75 to £

Dampers, &c.
Dampers and Clips, Buffalo.....dis 40 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₩ doz $1.30
Gray's.....₩ gro, $20.00, dis 20 %
Bee Rod.....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $1.80, dis 40&10&50 %
Gem (Coil), list April 19, 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₩ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₩ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
Witherby and Douglas, P. S. & W.....dis 75&10 @ 75&10 %
New Haven and Middlesex.....dis 60&10&10 %
Merrill.....dis 60&10&10 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 20 @ 25 %
Wilkinson's Folding.....dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Miliers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's.....each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Triple Action.....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $15.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1/ %
Automatic Boring Tools.....each, $1.75 @ $1.85
Twist Drills—
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %
Drill Bits.—See Augers and Bits.
Drill Chucks.—See Chucks.
Dripping Pans.
Small sizes.....₩ ℔ 7 ¢
Large sizes.....₩ ℔ 6½ ¢

Egg Beaters.
Dover.....₩ doz., $2.00
National.....₩ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₩ gro, $17.00@$18.00
Standard (Standard Co.).....₩ gro, $9.00
Kingston (Standard Co.).....₩ gro, $6.50
Acme (Standard Co.).....₩ gro, 10.00
Dupiex (Standard Co.).....₩ gro, $18.00
Rival (Standard Co.).....₩ gro, $12.00
Triumph (T. & S. Mfg. Co.).....₩ gro, 10.50@11.50
Advance No. 1.....₩ gro $10.50
Advance, No. 2.....₩ gro $10.00
Bryant's.....₩ gro $15.00
Ayres' Spiral.....₩ gro $5
Double (Hamblin & Russell Mfg Co.).....₩ gro, $16.20
Easy (Hamblin & Russell Mfg. Co.).....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.).....₩ gro, $4.50
Paine, Diehl & Co's.....₩ gro $24.00
Electric Self-Il Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₩ ℔	4 ¢	5 ¢	2½¢
½ kegs, ₩ ℔	4½¢	5½¢	2¾¢
¼ kegs, ₩ ℔	4¾¢	5¾¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6¾¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 35 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&10&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bbl. lots.....dis 50&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₩ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₩ doz $36.00—dis 25&10 %
Felloe Plates......₩ ℔ 6 @ 6¼¢
Fifth Wheels.—Derby and Cincinnati..dis 45&5 %
Files.
Domestic—
Best brands.....dis 60&10 @ 60&10&10 %
Good brands.....dis 60&10&10 @ 70 %
Fair brands.....dis 70 @ 70&10 %
Heller's Horse Rasps.....dis 50&7½ @ 50&10 %
Mc affrey's Horse Rasps.....dis 50&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps.....American list .dis .60 %

Fi ting Machines.
Knox, 4¼-inch Rolls.....$3.25 each
Knox, 6-inch Rolls.....$3.60 each } dis 35 %
Eagle, 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5½-inch Roll.....2.85, dis 35 %
Crown, 4¼ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85.....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₩ doz $8, dis 40 %
Clark's Hand Fluter.....₩ doz $15.00, dis 35 %
Combined Fluter and Sad Iron...₩ doz $15.00, dis 30 %
Buffalo.....₩ doz $10.00 dis 10 %

Fluting Scissors......dis 45 %

Forks.—Hay, Manure, &c., Asso. list.....dis 65&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Shepard's Lightning.....dis 65 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₩ doz $4.50
Shepard's Queen City.....dis 40 %

Fry Pans.
Association List.....dis 75 @ 75&10 %

No.	0	1	2	3	4	5	6	7	8
₩ doz.	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11.25

Fuse.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise, &c.....dis 60&10 %
Wire, low list.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₩ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40@60&10 %
"Bee".....₩ gross $12, dis 25 @ 25&5 %

Glue.
Le Page's Liquid.....dis 25 @ 25&5%
Upton's Liquid.....dis 35 %

Glue Pots.
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 50 %

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼-in., Hemp.....dis 40&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co.....
C. Hammond & Son.....
Humason & Beckley.....
Atha Tool Co.....
List Jan. 15, '87 Dis. 50 @ 50& 10 %
Fayette R. Plumb.....dis 40&10 @ 50
Verree.....dis o %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 30 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under.....₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 36¢
Over 5 ℔.....₩ ℔ 30¢
dis 70 @ 70 &5 %
Wilkinson's Smiths'.....10¼¢ @ 11¢ ₩ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz...dis 10%
Providence Tool Co. Leg Irons, $35.00 ₩ doz....dis 10 %
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₩ doz, $48; Nickeled, $57; 3 Hands, Polished, ₩ doz. $72; Nickeled, $84.....dis 30 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

....dis 60&10&10 %
Roggin's Latches.....₩ doz. 30¢ @ 35¢
Bronze Iron Drop Latches.....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₩ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₩ gross $2.00
Hickory Firmer Chisel, assorted.....₩ gross 4.50
Hickory Firmer Chisel, large.....₩ gross 5.0C
Apple Firmer Chisel, assorted.....₩ gross 5.00
Apple Firmer Chisel, large.....₩ gross 6.00
Socket Firmer Chisel, assorted.....₩ gross 3.00
Socket Framing Chisel, assorted.....₩ gross 5.00
dis 40 @ dis
J. R. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₩ gross 2.75
Auger, assorted.....₩ gross 5.00
Auger, large.....₩ gross 7.00
dis 40 @ 40&10 %
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₩ set $1.25 net
Patent Auger, Swan's.....₩ set $1.60 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 65 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70 %
Climax Anti-Friction.....dis 55 %
Climax Steel Anti-Friction.....dis 50 %
Zenith fer Wood Track.....dis 55 %
Reed's Steel Arm.....dis 40 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 45&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18.....dis 55&2 %
Cheritree.....dis 50&2 %
Kidder's.....dis 50&10 @ 60 %
The "Rose".....dis 60 %

Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent. .....₩ dos. pr., 3½ in. $10; 5 in., $12.....dis 50 @ 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18 %.....dis 50&10 @ 50&15 %
Wood Track Iron Clad..₩ ft. 10¢, dis 50&10 @ 50&15 %
Carrier Anti-Friction.....dis 50&10%
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₩ set $4.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge. .....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&c %
American.....₩ set $3; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 6¼, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel, Cast Iron.....dis 50 %
Nickel, Malleable Iron and Steel.....dis 40 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Gammons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40@10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %
Shingling, Nos. 1 2 3.....₩ dos $5.50 $6.00 $6.50
Claw, Nos. 1 2 3.....₩ doz 6.00 6.50 7.00
Lathing Nos. 1 2 3.....₩ dos 5.50 6.00 6.50

Hay Knives.

Lightning.....Mfrs. price ₩ doz $18 dis 25 %; Jobber's Extras
Electric.....₩ doz $17 } dis 30 @
Gem.....₩ doz $18 } 30&5%
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—
Strap and T.....dis 70&10 %
Screw Hook and Strap. { 8, 10, 12 in., ₩ lb. 3½¢ / 14 to 36 in. ₩ lb. 3¾¢
Heavy Welded Hook { 8 to 12 in., ₩ lb. 3½¢ / 14 in. & up, ₩ lb. 2¾¢
Screw Hook and Eye. { ⅝ in. ₩ doz $1.50 / ¾ in. ₩ doz $2.45 { dis / ⅞ in. ₩ doz $3.80 } 10%
Rolled Blind Hinges, Nos 32 and 34.....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10
Plate Hinges { 8, 10 & 12 in., ₩ lb. .5 / "Providence" } over 12 in., ₩ lb. .4

Spring Hinges—
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme and U. S.....dis 30 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

Gate Hinges—
Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60@10 @ 60&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.80, dis 50 %
Seymour's.....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20.dis 60&10@60&10&10 %
Shepard's, No. 3.....dis 60&10@60&10&10 %
Reed's Latch and ringes.....₩ doz sets $12, dis 50 %

Blind Hinges—
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 60.....dis 75&10&5@80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's "Noiseless." Nos. 50, 60, 65 & 55.....dis 75&10&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5...dis 80 %
Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 80&2½ %
Shepard's Champion Gravity No. 75.....dis 80&10&5 %
Shepard's Steamboat Gravity, No. 10.....dis 80&20 %
Shepard's Acme Lull & Porter.....dis 75&5@75&10 %
Shepard's O. S. Lull & Porter.....dis 75&10 %
Shepard's "Queen City" Reversible.....dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.

Handled—
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ doz $4.75

Eye—
D. & H. Scovil.....dis 15 %
Lane's Crescent Scovil Pattern.....dis 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard. S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Bare " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.....₩ doz. $5.50 @ 5.75
Hill's Old Style Ringers.....₩ doz. $3.00 @ 3.25
Hill's Tongs.....₩ doz, $5.50 @ 6.00
Hill's Rings.....₩ doz boxes, $2.00 @ 2.25
Perfect Rings.....₩ doz boxes $1.75 @ 2.00
Perfect Ringers.....₩ doz $2.50
Blair's Hog Ringers.....₩ doz, $2.00 @ 2.65
Blair's Hog Rings.....₩ doz 90¢ @ $1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz, $1.25 @ 1.30

Hoisting Apparatus

"Moore's" Hand Hoist, with Lock Brake.....dis 15 %
"Moore's" Differential Pulley Block.....dis 20 %

Holders, Tool.

Balz Pat.....₩ doz $4; dis 25 %

Hollow-Ware.

Iron—
Stove Hollow-Ware. Ground..dis 60&10@60&10&10 %
Stove Hollow-Ware. Unground dis 70&10@70&10&5 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70&10 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&10 @ 40&5 %
Gray Enameled Ware.....dis 10 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.

Cast Iron—
Bird Cage. Sargent's list.....dis 60&10&10 %
Bird Cage. Reading.....dis 60&10&10 %
Clothes Line. Sargent's list.....dis 60&10&10 %
Clothes Line. Reading list. dis 60&10 @ 60&10&10 %
Ceiling. Sargent's list.....dis55&10&10 %
Harness, Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat. Sargent's list.....dis 55&10 %
Coat and Hat. Reading.....dis 50&10 @ 50&10&10 %

Wrought Iron—
Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

Wire—
Wire Coat and Hat, Gem, list April, 1886.....dis 45 %
Wire Coat and Hat. Miles', list April, 1886.....dis 45
Indestructible Coat and Hat.....dis. 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₩ doz $2.00
Rush.....dis 55 @ 60 %
Whiffletree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

Nos.	6	7	8	9	10	
Ausable	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton. Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10
Putnam	24¢	22¢	21¢	20¢	19¢	dis 5&10&2½&2½ %
Vulcan	23¢	21¢	20¢	19¢	18¢	dis 12½&5
Northwest'n.	25¢	23¢	22¢	21¢	20¢	dis 10&10&5&5 %
Globe	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 25& 10&5 %
C. B.-K.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 25& 10&5 %
Champlain	28¢	26¢	25¢	24¢	23¢	dis25&10&10&5 %
New Haven	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac	23¢	21¢	20¢	19¢	18¢	dis 30&10 %
Champion	25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell	28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star	28¢	21¢	20¢	19¢	18¢	dis 10&10@10&12½ %
Anchor	23¢	21¢	20¢	19¢	18¢	dis 30&5 %

Western.....10¢ per lb., all sizes
Empire Bronzed.....14¢ per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....75&10 @ 80 %
Standard.....dis 70&70&10 %
Extra.....dis 60@10&10 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50&5 %
N. Y. B. & P. Co., Dundee.....dis 60&10&10 %

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd.....₩ doz $3.00, dis 20@20&5 %
National Ice Chisel.....₩ doz $6.25, dis 20 %
Novelty Ice Breakers.....₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.....₩ doz $2.00, dis 15 %
Wood Head Picks, Sargent's....₩ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's.....₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle.....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₩ doz $1.25, dis 20&10 %
Combination Ice Tools.....₩ doz $2.00 net
Acme Ice Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.....₩ doz $4.00, dis 25&10 %
Family.....₩ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

Brass, 7 to 17 in., ₩ lb.	Spun. 24¢	Stamped. 22¢
Brass larger than 17 inches, ₩ lb.	26¢	24¢

Enameled and Tea Kettles.....See *Hollow-Ware*

Keys.

Lock Asso'n list Dec. 30, 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₩ doz $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.....₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ doz $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₩ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.

Door Mineral.....65@68/
Door Por. Jap'd.....75@78¢
Door Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@60&10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885.....dis 40 %
Furniture Plain.....75¢ gross inch. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 60%&10 %
Picture, Hemacite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carrriage, Japanned.....₩ gross 80¢, dis 60&10 %

Ladles.

Melting, Sargent's.....dis 55&10
Melting, Reading.....dis 35&10%
Melting, Monroe's Patens.....₩ doz. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lanterns.

Tubular, No. 9, without Guards.....₩ doz $5.75
Tubular, Liftwire, No. 0, without Guards ₩ doz $8.50
Tubular, Hinge Tip No. 0, without Guards, ₩ doz $6.25
Tubular Bottom Lift, without Guards ..₩ doz $6.25
Tubular, U. S. Safety Lift Wire, no Guards, ₩ doz $5.00
Guards for Tubulars, add ₩ dos.....
Police, small, $6.00; Med. $7.25; Large, $9.75. dis 20@25%
Porter's Tin R. R.....$10 dis 20 %

Lemon Squeezers.

Porcelain Lined, No. 1.....₩ doz. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ doz $1.70 @ 1.75
Dunlap's Improved.....₩ doz. $3.75, dis 20 %
Sammis'.....No. 1, $5; 2, $9; 12, $18 ₩ doz., dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ doz $2.50
Dean's.....Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $5.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 40
Wire Clotnes, No. 18, $3.75; No 19, $3.25; No. 20, $2.75.
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ doz. dis 20 %

Locks. Padlocks. Cabinet Locks, &c.

Door Locks, Latches, &c.—
List, Dec. 30, '86, chgd Feb. 2, '87...dis 50&10 @ 60&5 %
Note.—Lower net prices often made.
Sargent & Co. (list Feb. 1, 1888).....dis 50&10&2 %
Reading Hardware Co. (list Feb. 2, '88).dis 55@60&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Man'y's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Diets Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American".....dis 40&10 %
Seed's N. Y. Hasp Lock.....dis 25 %

Cabinet—
Eagle, Gaylord Parker and Corbin, } List March, '84, revised Jan. 1, '85. dis 33⅓&2 %
Deitz, Nos. 36 to 39.....dis 40 %
Deitz, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 96.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
"Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
"Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %

Padlocks—
List, Dec. 23, 84.....dis 65&10&2&—4%
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's, Nos. 0 to 91.....dis 30 %
Romer's Scandinavian and others, Nos. 100 to 508.....dis 15 %
A. E. Dietz.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
"Star".....dis 45 %
"Horse Shoe." ₩ doz., $9.....dis 40 %
Barnes Mfg. Co.....dis 40%
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis90 %
Fraim's Pat. Scandinavian new list (low)....dis 60 %

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....₩ doz $20.00
Ring Peaves, Common Finish.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies.....₩ doz $19.00
Cant Hooks, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Common Finish.....₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin.₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₩ doz $12.00
Hand Spikes.....₩ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz..... 10.00 11.00 13.00 16.00 20.00
Pike Poles, not Ironed, ₩ doz..... 6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ doz..... 14.00 15.00 17.00 .....
Swamp Hooks.....₩ doz $18.00
Landing Blocks.....₩ doz $22.50
Skidding Tongs.....₩ doz $51.00
Log Binders.....₩ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples.....₩ dos $30.00

Lustre.

Four-ounce Bottles.....₩ doz. $1.75 ₩ gro. $17. 00

Mallets.

Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V...dis 30 @ 30&10 %

Match Safes.

Dangerfield's Self-Igniting.....₩ doz $1.00

Mattocks.—Regular list.....dis 60&5 @ 60&10 %

Meat Cutters

Dixon's—Nos. 1 2 3 4
₩ doz.....$14.00 17.00 19.00 30.00—dis 45 %
Woodruff's..... Nos. 100 150
₩ doz. $15.00 18.00—dis 45 %
Champion.....Nos. 200 300 400
₩ doz. $22.00 27.00 40.00—dis 45 %
Hales' Pattern Nos. 11 12 13
₩ doz...$27.00 33.00 45.00 } dis 70 @ & 5 %
American.....dis

Nos.	1	2	3	4B		
Each	$5.00	7.00	10.00	25.00	50.00	60.00

Enterprise.....dis 30

Nos.	10	12	22	32	42
Each	$3.	2.50	4.00	6.00	15

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
$ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
$ doz. $22.00 30.00 40.00—dis 45@45&10 %
Heme No. 1.....$26 $ doz, dis 55&10 %
Draw Cut..Nos. 5 2 6 8
Each...$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....$ dos. $66.00

Mincing Knives.
Am. (2d quality), $ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, $ dos, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....dis 50@10@60 %
Buffalo Adjustable.....$ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½%
Stebbins' Genuine.....dis 60&10@10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %
Boss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00. $ doz, dis 60&10&10 %

Money Drawers.—$ doz., $18 @ $20.

Muzzles.—Safety, $ dos. $3.....dis 25 %

Nails.....See Trade Report
Wire Nails and Brads, list July 14, '87.....dis 60&10&10 @ 70&5 %
Wire Nails, Standard Penny.....$ keg, $2.75 @ $2.85

Nail Puller.—Curtiss Hammer....$ doz $9.00 net
Giant, No. 1.....$ doz $30.00, dis 10 %
Pelican.....$ doz $9.00, dis 25 %
Boss.....$ doz $30, dis 30 %

Nail Sets.—Square.....$ gro., $4.00 @ $4.25
Round.....$ gro., $3.25
Cannon's Diamond Point.....$ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....$ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts and Washers.
Size.... ¼ 5-16 ⅜ ½ ⅝ ¾ 1
Washers..... 7 5¼ 4¾ 4 3½ 3⅛ 3⅛
Nuts, all kinds, 5¢ off list Jan. 1, 1883.
In lots less than 100 lb, $ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....$ ℔ 8½¢
U. S. Navy.....$ ℔ 7¾¢
Navy.....$ ℔ 7 ¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, *No 1*, $3.60; No. 2, $4.00; No. 3, $4.40 $ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.
Rubber—
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....$ ℔ 65¢, dis 30 %
Jenkins' Standard.....$ ℔ 80¢, dis 35 %
Miscellaneous—
American Packing.....10¢ @ 11¢ $ ℔
Russia Packing.....14¢ $ ℔
Italian Packing.....13 @ 14¢ $ ℔
Cotton Packing.....15 @ 17¢ $ ℔
Jute.....7 @ 8¢ $ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—
Quarts..... 10 12 14
Hill's Light Weight, $ doz..... $2.75 3.00 3.25
Hill's Heavy Weight, $ doz..... 3.00 3.25 $3.75
Whiting's..... 2.75 3.00 3.25
Sidney Shepard & Co..... 2.67 .... 3.23
Iron Clad..... 2.75 3.00 3.25
Fire Buckets..... 2.75 3.25 3.50
Buckets, see Wall Buckets
Indurated Fibre Ware—
Star Pails, 12 qt.....$ doz $4.50
Fire, Stable and Milk, 14 qt.....$ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....$ gro $5.25 net
Dixon's Lead.....$ gro $4.50 net
Dixon's Lumber.....$ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons.....$ dos 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 52½ %
1¼ and under, Galvanized.....dis 42½ %
1¼ and over, Plain.....dis 65 %
1¼ and over, Galvanized.....dis 52½ %
Boiler Tubes, Iron.....dis 55 %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50 @ 50&5 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.)..dis 20&10 %
Victor Planes (Stanley R. & L. Co.).....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 $ doz dis 20&10@33⅓&5 %
Humason & Beckley Mfg. Co.....dis 50@50&10 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Peppers, Corn.
Round or Square, 1 qt.....$ gro $10.50 @ $12
Round or Square, 2 qt.....$ gro $23.50 @ $24

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger....$ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....$ doz $36.00, dis 20 %
Eureka Diggers.....$ doz $18 @ $17
Leed's.....$ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz, $24.00....dis 40 %
Kohler's Little Giant.....$ doz $18.00
Kohler's Hercules.....$ doz $16.00
Kohler's New Champion.....$ doz $9.00
Schneidler.....$ doz $18
Ryan's Post Hole Diggers.....$ doz $24
Cronk's Post Bars.....$ doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, $ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....$ doz $5.00 @ 5.50
Antrim Combination.....$ doz $8.00
Hoosier.....$ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, $ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....$ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears, Henry's Pat...$ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....$ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...$ doz $12, dis 20 %
Duniap's Saw and Chise.....$ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %

Pumps.—Cistern, Best Makers.....dis 50 @ 10@60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....$ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....$ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Cheek.....dis 40 %
Solid Tinners'.....$ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 30&2 %

Rail. Sliding Door, Wrt. Brass $ ℔ 35¢, dis 20 @ 20&5 %
Sliding Door, Bronzed Wrt. Iron.....$ foot 7¢
Sliding Door Iron, Painted....$ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ¾ ⅝ ½
Per 100 feet..... $2.50 3.00 4.10—dis 10 %
R. D. for N. E. Hangers—
Small. Med. Large
Per 100 feet..... $2.15 2.70 3.25 net
Terry's Wrought Iron, $ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ $ foot.....dis 50&? %
Carrier Steel Rail, per foot.....4½¢

Rakes.
Cast Steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20 %
Wostenholme and Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....$ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....$ doz $2
Lamont Combination.....$ doz $4

Rivets and Burrs.
Copper.....dis 50, with Jobbers' Extras.
Iron, list November 17, 1887.....dis 50 %

Rivet Sets.....dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 20&2 %
Stair, Black Walnut.....$ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅜ inch and larger $ ℔ 10¢, net
Manila.....⅜ inch $ ℔ 11¼¢ net
Manila.....¼ and 5-16 inch $ ℔ 11¾¢ net
Manila Tarred Rope.....$ ℔ 10½¢ net
Manila Hay Rope.....$ ℔ 10½¢ net
Sisal.....½ inch and larger $ ℔ 9¾¢ net
Sisal.....⅜ inch $ ℔ 10½¢ net
Sisal.....¼ and 5-16 inch $ ℔ 10¾¢ net
Sisal Hay Rope.....$ ℔ 9¾¢ net
Sisal, Tarred Rope.....$ ℔ 9¼¢ net
Sisal, Medium Lath Yarn.....$ ℔ 8¾¢ net
Cotton Rope.....$ ℔ 15 @ 18¢ net
Jute Rope.....$ ℔ 7¢
Dis 1½% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 55&10 %

Sad Irons.
From 4 to 10, at factory.....$ 100 $ $2.75 @ $2.85
Self-Heating.....$ doz. $9.00 net
Self-Heating, Tailors'.....$ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...$ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.....$ doz., $24.00 net
Chinese Laundry (N. E. Bust Co.).....$4¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....$ ℔, 10¢ @ 11¢
Patent, good quality.....$ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....$ ℔ 28¢ @ 29¢
Common Russia Sash.....$ ℔ 13½¢
Patent " " .....$ ℔ 15¢
Cable Laid Italian " .....$ ℔ 22¢ @ 23¢
India Cable Laid " .....$ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....50¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp.....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 $ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap'd, Cop'd and Br'sed..$ gross $4.50
Common Sense, Nickel Plated.....$ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Huguniu's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&2&2 %
Huguniu's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 40 %
Liesche's Nos. 100 & 110 $ gro. $5; 105, $10.dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55@55&5 %

Sash Weights.
Solid Eyes.....$ ton. $25

Sausage Stuffers or Fillers.
Miles' "Challenge".....$ doz. $20, dis 50@50&5 %
Perry.....$ dos. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $90.00, dis 20 %
Enterprise Mfg. Co.....dis 60&10 @ 30 %
Oliver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %
Disston's Cross Cuts..dis 45@45&5 %
Disston's Hand.....dis 25@25&5 %
} Extras sometimes given by jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....$ foot 75 ¢
Atkins' Concave Tooth Dexter X Cuts.....$ foot 55 ¢
Atkins' Special Steel Diamond X Cuts.....$ foot 32 ¢
Atkins' Champion and Electric Tooth X Cuts
$ foot 30 ¢
Atkins' Hollow Back X Cuts.....$ foot 21 @ 22¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10&5 %
W. M. & C. Champion X Cuts, Regular $ foot .24@26¢
W. M. & C. X Cuts, Thin Back.....$ foot 27@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip.....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....$ foot 25¢
Peace Cross Cuts, Thin Back.....$ foot 27@29¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....$ gro $9 @ $10
Red, Polished, and Varnished....$ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....$ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..$ doz $3.25 and $5.25, dis 40&5@40&10%
Common Lever.....$ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, $9. No. 16, $5.50..dis 20&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.00 @ $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %

Saw Tools.
Atkins Perfection.....$15.00; Excelsior $6.00 $ doz.

Scales.
Hatch, Counter, No. 171, good quality.....$ doz $21.
Hatch, Tea, No. 161.....$ doz $6.75 @ $7.00
Union Platform, Plain.....$2.30 @ 2.35
Union Platform, Striped.....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Scale Beams, Custer.....dis 30@33⅓ %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.....$ doz $4.00, dis 10 %
Box, 2 Handle.....$ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....$ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons. Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45& 10 %
Disston's Patent Excelsior.....dis 45& 10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 70&10&10 %
Sargent & Co.'s No. 20.....dis 66⅔&10&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel....dis 60&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 70&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4...dis 50&5 @ 50&10 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Ellrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....$ doz $6, dis 25&10

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro. 6.25
Frav's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
} Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 ,
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ dos $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 70 %
Coach and Lag, Gimlet Point.....dis 66⅔@66⅔&5 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.

Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

Scythe Snaths.....dis 50&10 %

Shears.

American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881 dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec., 1881, dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers.dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel.....dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %

Sheaves.

Sliding Door—
M. W. & Co., list Jan. 1, 1887.....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2
Moore's Anti-Friction.....dis 60

Sliding Shutter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.

L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.

Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—Add $1 ₩ keg to above prices.

Oz, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot.—*(Eastern prices, 2¢ off, cash, 5 days.)*

Drop, ₩ bag, 25 ℔.....$1.50
Drop, ₩ bag, 5 ℔.....35
Buck and Chilled, ₩ 25-℔ bag.....$1.75
Buck and Chilled, ₩ 5-℔ bag.....40

Shovels and Spades.

Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 15 @ 15&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886....dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.

Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.

Western list.....dis 75 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co.....dis 50&10 %

Sieves.

Buffalo Metallic, S. S. & Co., new list.....dis 50&25 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₩ doz.	70¢	90¢
Mesh 20, Nested, ₩ doz.	85¢	$1.00
Mesh 24, Nested, ₩ doz.	$1.00	1.10

Slates.—School, by case.....dis 0&10 %

Snaps, Harness, &c.

Anchor (T. & S. Mfg Co.).....dis 65 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 60&2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.
Avert's Adjustable, list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 30&10 @ 30 %

Spoke Trimmers.

Bonney's.....₩ dos $10.00, dis 50 %
Stearns'.....
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ dos, dis 50&10 %
Douglass'.....₩ dos $9.00, dis 20 %

Spoons and Forks.

Tinned Iron—
Basting, Central Stamping Co.'s list, dis 70@70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %

Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50 @ 50&10 %
Simpson, Hall, Miller & Co.....dis 50 @ 50&10 %
Holmes & Edwards Silver Co.....dis 50 @ 50&10 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 40&5 %
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 55 %

Springs.

Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.
Steel and Iron.....
Nickel-Plated.....
} .....dis 70 @ 70&10 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

Staples.
Fence Staples, Galvanized.....₩ ℔, 4¢
Fence Staples, Plain.....₩ ℔, 3¢

Steelyards......dis 40&10@50&5 %

Stocks and Dies.
Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plates.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 5¢.
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 1 @ 22¢
Washita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1, Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone, No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Whets, ₩ gro.....$24.00

Stove Polish.
Joseph Dixon s.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₩ gal. $0.90 .80 .70 .60
Yates Standard Paste Polish, 10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Royal Glass.....₩ gro $2.50
Diamond O. K Enamel.....₩ gro $19.00

Tacks, Brads, &c.
List Jan 2, 1888.

American Iron Carpet Tacks	dis 72½&10&2 %
Steel Carpet Tacks	dis 72½&10&2 %
Swedes Iron Carpet Tacks	dis 72½&10&2 %
American Iron Cut Tacks	dis 70&10&2 %
Swedes Iron Tacks	dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks	dis 67½&10&2 %
Tinned Swedes Iron Tacks	dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers' Tacks	dis 67½&10&2 %
Gimp and Lace Tacks	dis 67½&10&2 %
Tinned Gimp and Lace Tacks	dis 67½&10&2 %
Swedes Iron Trimmers' Tacks	dis 67½&10&2 %
Swedes Iron Miners' Tacks	dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks	dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list)	dis 72½&10&2 %
Copper Tacks	dis 33⅓&10&2 %
Copper Finishing Trunk and Clout Nails	dis 33⅓&10&2 %
Finishing Nails	dis 60&10&2 %
Trunk and Clout Nails	dis 60&10&2 %
Tinned Trunk and Clout Nails	dis 60&10&2 %
Basket Nails	dis 60&10&2 %
Common and Patent Brads	dis 60&10&2 %
Hungarian Nails	dis 60&10&2 %
Chair Nails	dis 60&10&2 %
Zinc Gialzers' Points	dis 40&10&2 %
Cigar Box Nails	dis 45&10&2 %
Picture-Frame Points	dis 45&10&2 %
Looking-Glass Tacks	dis 45&10&2 %
Leathered Carpet Tacks	dis 45&10&2 %
Brush Tacks	dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %	

Extra 40 % generally given.

Lining and Saddle Nails, List Jan. 1, 1886:

Silvered	dis 30&10&10 %
Japanned	dis 20&10&10 %
Double-pointed Tacks	85 %
Wire Carpet Nails	dis 50&10 %
Wire Brads and Nails	See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list	dis 50&10 %

Tap Borers.

Common and Ring	dis 20&10 %
Ives' Tap Borers	dis 33⅓&5 %
Enterprise Mfg. Co	dis 20&10 @ 30 %
Clark's	dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.
Steel Wire, Standard list.....dis 50&10&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓ %

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 1887.....dis 70 @ 70&10&5 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion)	dis 20&10 @ 30 %
Wood Bottom	₩ dos $5.00 @ $5.25
All Iron	₩ doz $4.25
Nashua Lock Co.'s	₩ dos $18.00, dis 50 @ 55 %
Wilson's	dis 55 %
Clipper (Sargent & Co.)	₩ doz $24, dis 50&10&10 %
Acme	₩ doz $20.00, dis 40 %

Transom Lifters

Wollensak's Patent Iron Bronzed	dis 50 %
Reiher's Bronzed Iron Rods list Jan. 1, 1887	dis 50&2 %
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887	dis 50&2 %
Excelsior	dis 50&10&2 %
Shaw's	dis 50&10 %
Payson's Universal	dis 40 @ 40&10 %
Crown and Star	dis 50 %

Traps.

Game—
Newhouse.....dis 35 @ 40&5 %
Oneida Pattern.....dis 60&10&10 @ 70 %
Game, Blake's Patent.....dis 40&10&5 %

Mouse and Rat—
Mouse, Wood, Choice.....₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 15
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.

Lothrop's Brick and Plastering	dis 35
Reed's Brick and Plastering	dis 15 %
Disston's Brick and Plastering	dis 25 @ 25&10 %
Peace's Plastering	dis 25 %
Clement & Maynard's	dis 20 %
Rose's Brick	dis 15 @ 20 %
Brade's Brick	dis 25 %
Worrall's Brick and Plastering	dis 20
Garden	dis 70 %

Triers.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

		BC.	R.
No. 9, Flax Twine, ¼ and ⅛ ℔ Balls		22¢	50¢
No. 12,	" "	¼ and ⅛ "	21¢ 20¢
No. 18,	" "	¼ and ⅛ "	18¢ 28¢
No. 24,	" "	¼ and ⅛ "	18¢ 28¢
No. 36,	" "	¼ and ⅛ "	16¢ 27¢
No. 264, Mattrass,		¼ and ⅛ "	48 @ 50¢
Chalk Line, Cotton, ⅛ ℔ Balls			25¢
Mason Line, Linen, ⅛ "			55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)			11¼¢
3-Ply Hemp, 1 ℔ Balls			12 @ 12½¢
3-Ply Hemp, 1½ ℔ Balls			11 @ 11½¢
Cotton Wrapping, 5 Balls to ℔			15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls			10¢
Wool			6¼¢ @ 6¾¢
Paper			13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz			18¢

Vises.
Solid Box.....dis 50&10&5 @ 60 %
Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40%
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Vise.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.....₩ dos $15.00, dis 40 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 60&10&10 %
Hopkins'.....₩ dos $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.
Per lb.....2½¢

Washer Cutters.

Smith's Patent	₩ dos $12.00, dis 50&10&10 %
Johnson's	₩ dos $11.00, dis 33⅓ %
Penny's	₩ dos Pol. $14; Jap'd, $16..dis 55 %
Appleton's	₩ dos $16.00, dis 60&10 %
Bonney's	dis 30&10 %

Washers.—See Nuts and Washers.

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.

Hill's	₩ doz ..12 qt., $4.25 ; 14 qt., $5.25
Iron Clad	₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band	₩ dos $4.25 @ $4.50
Whiting's Wired Top	₩ doz $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70 ; 12 in., $3.25.

Wire.
Iron—
Market, Br. & Ann., Nos. 0 to 18.....dis 70&10@75 %
Market, Coppered, Nos. 9 to 18.....dis 70@70&10 %
Market, Galvanized, Nos. 0 to 18.....dis 65@65&10 %
Market, Tin'd, Tinned list Nos. 0 to 18, dis 65@65&5 %
Stone Br. & Ann'd, Nos. 16 to 18....dis 72½@72½&5 %
Stone, Bright and Ann'd, Nos. 19 to 26..dis 75@75&5 %
Stone, Br. & Ann'd, Nos. 27 to 36, dis 75&10@75&10&5 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36..dis 70@70&10 %
Tinned Broom Wire, Nos. 18 to 24, dis 72½@72½&5 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 70@70&5 %
Annealed Grape, Nos. 10 to 14.....dis 70@70&5 %
Brass and Copper, list, Jan. 18, '84.....dis 15 @ 20 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 55 %
Malin's Steel and Tinned Wire on Spools.....dis 50 %
Malin's Brass and Copper Wire on Spools.....dis 40 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to 8, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth, green, drab and black, ₩ 100 sq. No. 34 Wire, $1.90; No. 33 Wire, $2.00

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 35&10 %
Baxter's Diagonal.....dis 40 @ 40&10
Coes' Genuine.....dis 55&3 %
Coes' "Mechanics'".....dis 55&10&2 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agricultural.....
Sterling Wrought.....
} dis 80 @ 80&5 %
Bemis & Call's Patent Combination.....dis 35 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Patt.....dis 35 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40&5 %
Bemis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ dos $4.00, dis 40 %
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 25&25&10 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 25 %
Acme, Bright.....dis 60&2 %
Acme, Nickeled.....dis 50&2 %
Walker's.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wrought Goods.
Staples Hooks, &c., list Jan. 12, '87, dis 80&20@&4&1 %

CURRENT METAL PRICES.

APRIL 4, 1888.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :
¾ to 2 in. round and square.. } ₩ lb 2.00 @ 2.10¢
1 to 6 in. x ⅜ to 1 in..... }
Refined Iron :
¾ to 2 in. round and square.. }
1 to 4 in. x ⅜ to 1½ in..... } ₩ lb 2.30 @ 2.80¢
4½ to 6 in. x ⅜ to 1 in..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.40 @ 2.50¢
Rods—⅝ and 11-16 round and sq..₩ lb 2.30 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12.....₩ lb 2.40 @ 2.50¢
"Burden Best" Iron, base price..₩ lb 3.09 @ .... ¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2.80 @ ....¢
"Ulster"..... lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 3¢ @ 3½¢
Best Cast Steel, base price in small lots.9¢ @ 10¢
Best Cast Steel Machinery, base price in small lots..... 5½¢ @ 6¢

Extras on Merchant Steel.

For classification and extras adopted by the Merchant Steel Association of the United States January 11, 1888, see *The Iron Age*, Feb. 23, 1888.

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₩ lb 2.75	@ 2.80¢	3.25	@ .....¢
17 to 20	₩ lb 2.85	@ 3.00¢	3.25	@ 3.50 ¢
21 to 24.....	₩ lb 3.00	@ 3.10¢	3.50	@ .....¢
25 and 26.....	₩ lb 3.20	@ ....¢	3.75	@ .....¢
27.....	₩ lb 3.75	@ 3.87½¢	4.00	@ .....¢
28.....	₩ lb 3.50	@ .....¢	4.00	@ .....¢

	B. B.	2d qual.
Galvanized, 14 to 20....	₩ lb 4.80¢	4.50 ¢
Galvanized, 21 to 24.....	₩ lb 5.20¢	4.87½¢
Galvanized, 25 to 26.....	₩ lb 5.60¢	5.25 ¢
Galvanized, 27.....	₩ lb 6.00¢	5.62½¢
Galvanized, 28	₩ lb 6.40¢	6.00 ¢
Patent Planished.....	₩ lb A 10¢	B, 9¢
Russia.....	₩ lb 9½¢ @ 10¢	
American Cold Rolled B. B.....	₩ lb 5¢ @ 7¢	

English Steel from Store.

Best Cast .... ₩ lb 14½ @ 15 ¢
Extra Cast ..... ₩ lb 16½ @ 17 ¢
Swaged, Cast..... ₩ lb 16 ¢
Best Double Shear..... ₩ lb 15 ¢
Blister, 1st quality..... ₩ lb 12½¢
German Steel, Best..... ₩ lb 10 ¢
2d quality. ..... ₩ lb 9 ¢
3d quality ..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality..... ₩ lb 15 ¢
2d quality..... ₩ lb 14 ¢
3d quality..... ₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	38 @ 38½¢
Straits, Pigs.....	38 @ 38½¢
English, Pigs	37½¢
Straits in Bars.....	39 @ 40 ¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....	IC, 10 x 14.....	$6.50
" "	IC, 12 x 12.....	6.75
" "	IC, 14 x 20.....	6.50
" "	IC, 20 x 28.....	13.00
" "	IX, 10 x 14.....	8.00
" "	IX, 12 x 12.....	8.25
" "	IX, 14 x 20.....	8.00
" "	IX, 20 x 28.....	16.00
" "	DC, 12½ x 17.....	6.00
" "	DX, 12½ x 17.....	7.50
Calland Grade....	IC, 10 x 14.....	6.00
" "	IC, 12 x 12.....	6.25
" "	IC, 14 x 20.....	6.00
" "	IX, 10 x 14.....	7.50
" "	IX, 12 x 12.....	7.75
" "	IX, 14 x 20.....	7.50
Allaway Grade.....	IC, 10 x 14.....	$5.25 @ 5.50
" "	IC, 12 x 12.....	5.50 @ 5.75
" "	IC, 14 x 20.....	5.25 @ 5.50
" "	IC, 20 x 28.....	10.75 @ 11.00
" "	IX, 10 x 14.....	6.25 @ 6.50
" "	IX, 12 x 12.....	6.50 @ 6.75
" "	IX, 14 x 20.....	6.25 @ 6.50
" "	IX, 20 x 28.....	12.75
" "	DC, 12½ x 17.....	5.00 @ 5.25
" "	DX, 12½ x 17.....	6.00 @ 6.25

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.....	$4.90 @ $5.10
10 x 20.....	7.50 @ 8.00
20 x 28.....	10.00 @ 10.25
IX, 10 x 14, 14 x 20.....	6.00
RV Grade.—IC, 10 x 14, 14 x 20.....	4.90 @ 5.00

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20.....	$4.67½ @ $4 75
20 x 28.....	9 25 @ 9.50
IX, 14 x 20.....	5.67½ @ 5.75
20 x 28.....	11.37½ @ 11.50
Abecarne Grade.—IC, 14 x 20.....	4.50 @ 4.65
20 x 28.....	9.00 @ 9 25
IX, 14 x 20.....	5.50 @ 5.75
20 x 28.....	11.00

Tin Boiler Plates.

IXX, 14 x 26.....	112 sheets.....	$12.50 @ $12 75
IXX, 14 x 28.....	112 sheets.....	12 75 @ 13 00
IXX, 14 x 31.....	112 sheets	14.25 @ 14.50

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 ⅌ ad valorem.

Ingot.

Lake..... .....16.50¢ @ 17¢
"Anchor" Brand. ....16¢ @ 16.50¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	....
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	....	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.
Per pound.....	$0.28	0.30	0.32	0 35

Bolt Copper, ⅝ inch diameter and over, per pound..... .....25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.
14 ounce to square foot and heavier.....28¢
12 ounce and up to 14 ounce to square foot.....29¢
10 ounce and up to 12 ounce..... 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each .....30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each. ....15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ....12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... .....2½¢
For tinning both sides double the above prices.

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch ₩ lb.....	56¢	⅜ inch ₩ lb.....	47¢
½ " "	44¢	½ " "	41¢
⅝ " "	42¢	⅝ " "	39¢
¾ " "	40¢	¾ " "	37¢
⅞ " "	39¢	⅞ " "	36¢
1 " "	37¢	1 " "	34¢
1½ " "	34¢	1½ " "	31¢

Roll and Sheet Brass.

Discount from list. ....10 @ 15 ⅌

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter. ....5¾ @ 6¢
"Bergenport" ....8½¢
"Bertha"..... .....7¾ @ 8¢

Zinc.

Duty: Sheet, 2½¢ ₩ lb.
600 lb casks..... .....6¾¢
Per lb ....7 @ 7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.
American..... .....@ 5½¢
Newark ....@ 5½¢
Bar ....5¾ @ 6¢
Pipe..... .....7¾¢, dis 20 ⅌
Tin-Lined Pipe ....15¢, dis 20 ⅌
Block Tin Pipes..... .....55¢, dis 20 ⅌
Sheet ....8½¢, dis 20 ⅌

Solder.

½ @ ½ (Guaranteed)... .... 23¢
Extra Wiping ....20¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson ....₩ lb 15¢
Hallett's .... " 12¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops.....	55&2
Ground Stops, Hydrant Cocks, &c.....	55&2
Corporation Cocks.....	55&2
Corporation Cocks, "Mueller" Pattern, from Western list.....	55&2
Ground Basin and Shampooing Cocks.....	40&2
Compression Basin Cocks	50&2
Compression Basin and Sink Cocks.....	40&2
Compression Pantry Cocks.....	50&2
Compression Double Basin and Shampooing Cocks	40&2
Compression Double Bath Cocks.....	50&2
Compression Bibbs, Urinal Cocks, Fill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.....	50&2
Basin Plugs and Basin Grates.....	55&2
Bath and Wash Tray Plugs.....	55&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.....	55&2
Basin Clamps, Basin Joints and Strainers	55&2
Boiler Couplings, Ground Face, per set...	$1.25 net.
Boiler Couplings, Plain Face, per set	$1.20 net.
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.....	55&2
Union Joints.....	60&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.....	55&2
Hose Goods	55&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves.....	60&2
Finished Brass Globe Valves, with Finished Brass Wheels.....	40&2
Brass Globe Valves, with Patent Wood Wheels	60&2
Brass Globe Angle and Corner Valves.....	60&2
Brass Radiator Angle Valves.....	60&2
Brass Radiator Angle Valves, Frink's Patent.	60&2
Brass Cross and Check Valves	60&2
Brass Check Valves.....	60&2
Brass Hose Valves.....	60&2
Brass and Iron Frink Valves	60&2
Brass Safety Valves.....	60&2
Brass Vacuum Valves.....	50&2
Brass Whistle Valves.....	60&2
Brass Balance, Back Pressure and Foot Valves.	50&2
Brass Butterfly and Throttle Valves.....	50&2
Brass Pump Valves.....	50&2
Brass Steam Cocks.....	57½&2
Brass Service, Meter and Union Meter Cocks.....	57½&2
Brass Whistles, Water Gauges and Oil Cups..	60&2
Brass Hollow Plug, Tallow and Globe Oil Cups.	50&2
Brass Lubricators.....	60&2
Brass Air Valves.....	60&2
Brass Air Cocks	60&2
Brass Gauge Cocks.....	55&2
Brass Cylinder Cocks and Steam Bibbs.....	50&2
Brass Swing Joints and Expansion Joints....	50&2
Brass Test Pumps.	50&2
Brass Steam Fittings, Rough.....	60&2
Brass Steam Fittings, Finished..	2 &2
Brass Union Joints.....	60&2
Brass Soldering Unions and Nipples	55&2
Brass Hose Fittings, Fusible and Boiler Plugs.....	55&2
Iron Body Globe, Angle, Cross and Check Valves	65&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.....	65&2
Iron Cocks, all Iron	65&2
All Iron Valves.....	65&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings.....	67½&2
Plugs and Bushings	7½&2
Malleable Iron Unions..	60&2
Malleable Iron Fittings.....	25

Paints.

Black, Lamp—Coach Painters'.....	₩ lb 22 @ 24¢
" Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
" " best.....	23¢
Black Paint, in oil.....kegs, 8¢; assorted cans.	11¢
Blue, Prussian, fair to best.....	40 @ 55¢
" " " in oil.....	45 @ 55¢
" Chinese dry	70¢
" Ultramarine.....	18 @ 30¢
Brown, Spanish.....	1¼¢
" Van Dyke.....	10 @ 12¢
Dryers, Patent American..ass'd cans, 9¢; kegs, 7¢	
Green, Chrome	15 @ 23¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris..... good, 20¢; best, 25¢	
Green, Paris in oil..... good, 30¢; best, 35¢	
Iron Paint, Bright Red.....	₩ lb 2½¢
Iron Paint, Brown	₩ lb 1¼¢
Iron Paint, Purple.....	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red....	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown.....	₩ lb 5½¢
Iron Paint, Ground, Purple.....	₩ lb 6¢
Litharge.....	6½¢
Mineral Paints	2 @ 3¢
Orange Mineral.....	10¢
Red Lead, American.....	6½¢
Red Venetian (Eng.) dry.....	$1.65 @ $1.70
Red Venetian in oil..... asst'd cans, 11¢; kegs, 8¢	
Red Indian Dry.	9 @ 12¢
Rose Pink.....	10 @ 13¢